



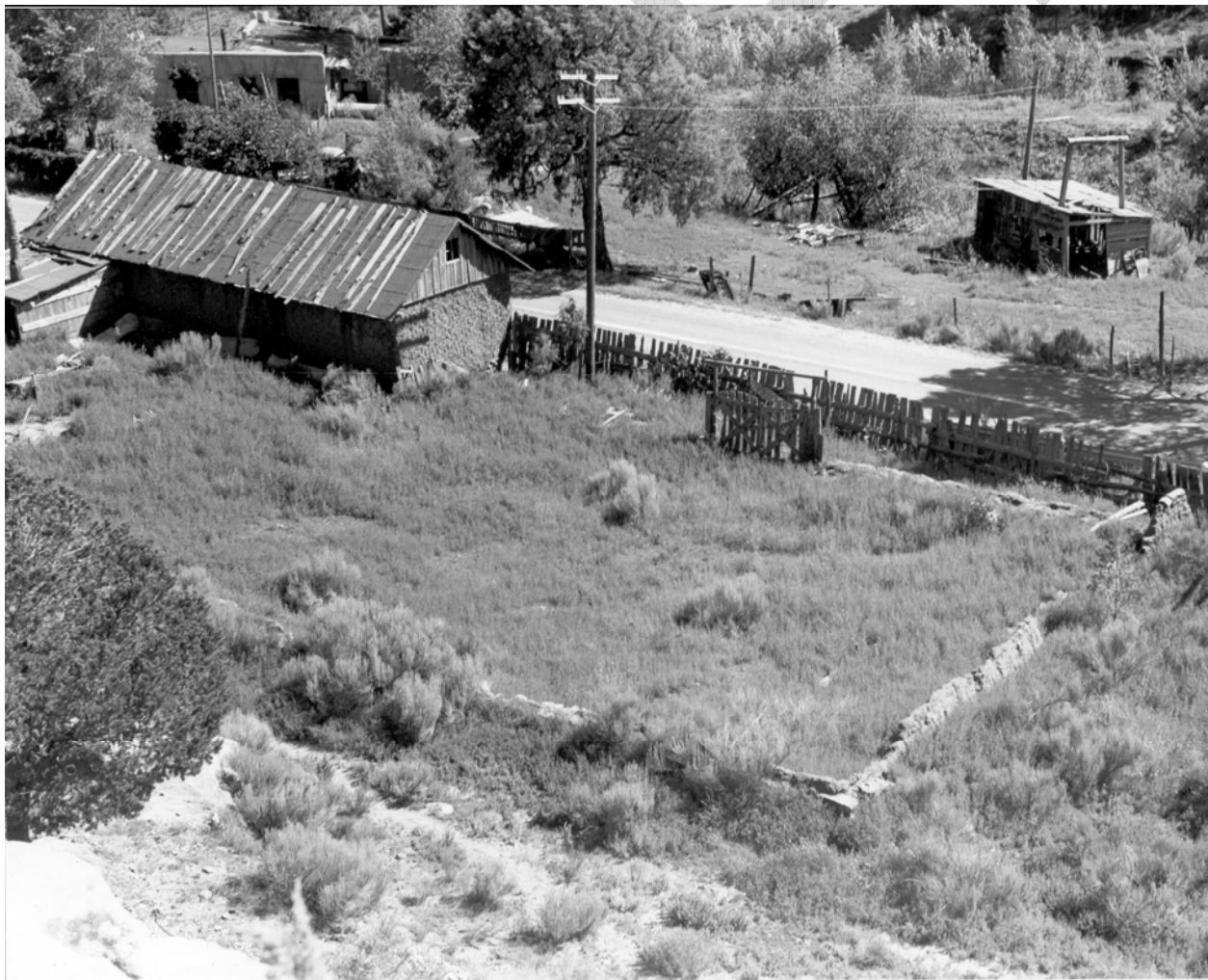
National Park Service  
U.S. Department of the Interior  
Pecos National Historical Park  
Pecos, New Mexico

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# Construct Interpretive Foot Trail from the Old Denver Highway to Arrowhead Ridge and Windmill Hill

## Environmental Assessment

May 2007



# Construct Interpretive Foot Trail from the Old Denver Highway to Arrowhead Ridge and Windmill Hill

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## Environmental Assessment

### Summary

Pecos National Historical Park proposes to construct a foot trail within the Pigeon's Ranch Sub-Unit of the Glorieta Battlefield Unit of Pecos National Historical Park. The trail would provide access to viewing areas of the battlefield site along Arrowhead Ridge and on Windmill Hill, and associated signage would provide interpretive information on the 1862 Battle of Glorieta Pass. The proposed project would involve constructing approximately 2.25 miles of trail located on lands managed by the National Park Service. By constructing this permanent trail, Pecos National Historical Park will fulfill its mandate to preserve, protect and interpret the battlefield.

This Environmental Assessment evaluates two alternatives; a no action alternative and an action alternative. The no action alternative is used as a baseline assessment, while the action alternative addresses construction of the new trail as well as installing signage and constructing a trailhead, parking area and improving an access road to the trailhead.

This Environmental Assessment has been prepared in compliance with the National Environmental Policy Act (NEPA) to provide the decision-making framework that 1) analyzes a reasonable range of alternatives to meet project objectives, 2) evaluates potential issues and impacts to Pecos National Historical Park's resources and values, and 3) identifies mitigation measures to lessen the degree or extent of these impacts.

Resources topics have been addressed in this document because the resultant impacts may be greater-than-minor include soils, vegetation, visitor use and experience, and park operations. All other resource topics have been dismissed because the project would result in negligible or minor effects to those resources. No major effects are anticipated as a result of this project. Public scoping was conducted to assist with the development of this document, and the majority of respondents supported the project.

### Public Comment

If you wish to comment on the Environmental Assessment, you may enter them online at the National Park Service website Planning, Environment, and Public Comment (<http://parkplanning.nps.gov/>) or you may mail comments to the name and address below. This Environmental Assessment will be on public review for 30 days ending May 30, 2007. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

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## **PURPOSE AND NEED**

### **Introduction**

Pecos National Historical Park is located 28 miles southeast of the state capital of Santa Fe, New Mexico in the counties of San Miguel and Santa Fe. Private lands bound the Park to the north, south, and west, while the eastside boundary is shared with the Santa Fe National Forest. The Park was expanded on November 8, 1990, by Congress to include the 682-acre Glorieta Unit, which was added to: “...*preserve and interpret the Battle of Glorieta Pass and to enhance visitor understanding of the Civil War and the Far West...*” (PL 101-536, 104 Stat. 2368). The Battle of Glorieta Pass is significant because it effectively ended the Confederate attempt to conquer the West. Pigeon’s Ranch and Canoncito are sub-units of the Glorieta Unit and they contain natural landmarks and historic resources associated with the battle.

The purpose of this Environmental Assessment is to examine the environmental impacts associated with constructing an interpretive foot trail within the Pigeon’s Ranch Sub-Unit of the Glorieta National Battlefield Unit of Pecos National Historical Park. This Environmental Assessment has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, regulations of the Council on Environmental Quality (CEQ) (40 CFR 1508.9), and the National Park Service Director’s Order (DO)-12 (*Conservation Planning, Environmental Impact Analysis, and Decision-making*).

## Purpose and Need

The purpose of the project is to provide expanded public access to the Civil War battlefield site of the Battle of Glorieta Pass.

Interpretation of the battlefield is cited in the 1990 enabling legislation for the Glorieta Battlefield Unit of the Park; "...the purpose of this Act is to preserve and interpret the Battle of Glorieta and to enhance visitor understanding of the Civil War and The Far West by establishing a new unit of Pecos National Historical Park". The project is needed because there is currently very limited public access to, and interpretation of the battlefield. Currently, the only public access to the battlefield is by participating in scheduled tours guided by Park Rangers and volunteers. Guided tours offer the only means of on-site interpretation and limited information on the battle is provided at the visitor center. Due to limitations in park staff availability, guided tours are offered only on a limited basis.

The proposed project involves constructing an interpretive foot trail to allow public access to viewpoints overlooking the battlefield. Stops along the trail would contain interpretive signs and information. Construction of this trail and accompanying trailhead would provide much needed public access to this site. The public would be able to visit the battlefield through self-guided and self-scheduled tours and need not rely on infrequently scheduled, guided tours. Trailhead parking and associated access road improvement, along with a designated trail built to National Park Service standards would allow for much safer and easier access to the site and assist in protecting surrounding resources by channeling visitors along one dedicated pathway.

The objectives of the project are to:

1. Open the battlefield to safe public access.
2. Provide expanded on-site interpretation of the Battle of Glorieta Pass.
3. Increase visitor opportunities and improve visitor enjoyment.
4. Minimize impacts and prevent impairment to park resources and values.

## Relationship of the Proposed Action to Previous Planning Efforts

The proposal to provide an interpretive foot trail within the Pigeon's Ranch Sub-Unit of the Glorieta National Battlefield Unit of Pecos National Historical Park is consistent with National Park Service *Management Policies* (NPS 2006). These policies call for protecting the integrity of natural resources, process, systems, and values of the park while providing opportunities for visitors to enjoy the parks. These policies also indicate that the National Park Service should work cooperatively with surrounding landowners and the general public to accomplish these goals.

Creating an interpretive foot trail within the Glorieta National Battlefield Unit is also consistent with previous planning efforts for the Park including the 1996 *Pecos National Historical Park General Management Plan/Final Environmental Impact Statement* (NPS 1996) and the *Pecos National Historical Battlefield Concept Plan* (NPS 2004d). Both plans recommend developing the battlefield to provide for visitor enjoyment and interpretation of the resource. These activities are consistent with the park's enabling legislation which states, "The purpose of this Act is to preserve and interpret the Battle of Glorieta and to enhance visitor understanding of the Civil War and the Far West..." (P.L.101-536-Nov. 8, 1990). Additionally, the proposal is consistent with the 2004 *Pecos National Historical Park Fire Management Plan* which designates this area of the Park as a full suppression zone due to the adjacent urban interface (NPS 2004a).

## Scoping

Scoping is a process to identify the resources that may be affected by a project proposal, and to explore possible alternative ways of achieving the proposal while minimizing adverse impacts. Pecos National Historical Park conducted both internal scoping with appropriate National Park Service staff and external scoping with the public and interested/affected groups and agencies.

Internal scoping was conducted by an interdisciplinary team of professionals from Pecos National Historical Park. Interdisciplinary team members met on February 13, 2007 to discuss the purpose and need for the project; various alternatives; potential environmental impacts; past, present, and reasonably foreseeable future projects that may have cumulative effects; and possible mitigation measures. Over the course of the project, team members also conducted site visits to view and evaluate the proposal to construct an interpretive foot trail within the Pigeon's Ranch Sub-Unit of the Glorieta National Battlefield Unit of Pecos National Historical Park.

External scoping was initiated with the distribution of a scoping letter and an internet posting to inform the public, stakeholders, agencies, and tribes of the proposal to construct a trail, and to generate input on the preparation of this Environmental Assessment. During the 30-day scoping period, six responses were received. The majority of comments were in support of the project. A few concerns were raised regarding: scenic value of the trailhead and parking area; location of the parking area and access road to private property; location of trail overlooks to private homes and possible view/sound-shed issues; and potential human/wildlife interactions. No other comments were received during scoping. More information regarding scoping can be found in *Comments and Coordination*.

## Impact Topics Retained for Further Analysis

Impact topics for this project have been identified on the basis of federal laws, regulations, and orders; National Park Service *2006 Management Policies*; and National Park Service knowledge of resources at Pecos National Historical Park. Impact topics that are carried forward for further analysis in this Environmental Assessment are listed below along with the reasons why the impact topic is further analyzed. For each of these topics, the following text also describes the existing setting or baseline conditions (i.e. affected environment) within the project area. This information will be used to analyze impacts against the current conditions of the project area in the *Environmental Consequences* chapter.

### Soils

According to the National Park Service's *2006 Management Policies*, the National Park Service will preserve and protect geologic resources and features from adverse effects of human activity, while allowing natural processes to continue (NPS 2006). These policies also state that the National Park Service will strive to understand and preserve the soil resources of park units and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources.

The geology of the Pigeon's Ranch Sub-Unit of the Park is sedimentary in origin, with Permian and Pennsylvanian bedrock deposits from 200-300 million years past. Most of this formation is covered by alluvial fill material with relatively thick soils. Soils surveyed in the Glorieta Unit/Pigeon's Ranch area are very stony clay and gravelly loams that exhibit moderate to slow permeability, medium to very high runoff potential, and severe to very severe risk for erosion. The region's history of uplift and cutting by Glorieta Creek has shaped the present topography with its alluvial gravel deposits and terraces (NPS 1999a).

The proposed trail site is located 1.5 miles southeast of Glorieta Pass within the Pigeon's Ranch Sub-Unit of the Park. Windmill Hill is the site's highest elevation at 7,373 feet and Arrowhead Ridge to the southeast reaches approximately 7,350 feet. An arroyo bisects these two sedimentary promontories and lies at approximately 7,260 feet. The southwestern aspect of Arrowhead Ridge slopes modestly from 7,350 to 7,300 feet while the northeastern aspect slopes more dramatically from 7,350 feet to 7,270 feet.

The proposed loop trail begins at the base of the southwestern slope of Arrowhead Ridge near the end of the Old Denver Highway. It will run northwest as it climbs to the ridge top; then follow the ridge top northwestward and cross the arroyo to Windmill Hill. From Windmill Hill the trail loops back to the southeast, re-crosses the arroyo back to Arrowhead Ridge, runs southeast along the ridge top nearly to the end of the ridge, then loops back and returns to the trailhead along the

Ridge's southwest slopes (see attached map). There are no significant geologic formations along the proposed route.

Soils protect and preserve native seed banks. If unmitigated, disturbances such as water-related erosion can expose or degrade these native seed banks, which can promote invasion by exotic plant species. Therefore, maintenance of the soils in the Park has numerous implications on erosion processes, vegetation community development and distribution, and wildlife.

Soil erosion and loss has occurred, at varying degrees, throughout the Park. Past management such as livestock grazing has led to altered vegetative communities and altered underlying soil stability over many areas with resulting decreases or absence of grass and forb cover that expose soils to rainfall and wind events, particularly on steeper slopes. In addition, impacts associated with present or future development or maintenance practices in or around developed areas would be adverse and potentially moderate in intensity. On trails, soil erosion may initially occur from soils being loosened from visitor use, and then may be removed by wind and water associated with storm events. Some soils, particularly on steeper sections, are more susceptible to erosion than other sections.

Use of the area in the past has had measurable effects on soils; therefore, this impact topic will be retained for further analysis.

## Vegetation

According to the National Park Service's *2006 Management Policies*, the National Park Service strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of plants (NPS 2006).

The proposed trail is located where the dominant vegetation type is pinyon-juniper woodland consisting of Colorado pinyon pine (*Pinus edulis*) and Rocky Mountain juniper (*Juniperus scopulorum*). Some open areas along the route are populated by rabbitbrush (*Chrysothamnus spp*) in addition to occasional cacti such as prickly-pear. On shaded northeast slopes of Arrowhead Ridge mature Ponderosa pine (15%) and scattered Douglas fir (>5%) are found along with an understory comprised of Gambel and Wavy Leaf oak and a few incidences of mountain mahogany. The southwestern slope of Arrowhead Ridge is mature pinon-juniper woodland (100%) with a few incidences of mountain mahogany in the understory. Unlike Arrowhead Ridge, Windmill Hill has mature Ponderosa pine (20%) on its hilltop in addition to the pinon-juniper canopy (80%). The vegetation found on the arroyo's plain is a pinon-juniper canopy (90%) with a few Ponderosa pines (10%). A number of exotic Siberian elm, approximately 20 years in age, are found adjacent to Interstate 25. On private lands adjacent to the Park, the vegetation may vary from native vegetation (grasses, shrubs, and pinyon-juniper) to sub-urban landscaping including manicured and irrigated lawns and shrubs and in some cases exotic species such as Russian olive and tamarisk.

A botanical survey of the Park was completed in 1994, and over 350 species of vascular plants were identified and listed. Of the total, 57 were exotic plants (NPS 1996). Much of the invasion of these species is due to human activities, such as development, past and current ranching activities within and nearby the Park, and from nearby roads, highways and Interstate 25. All of these activities provide means for non-native species to be introduced into and spread throughout the Park. Once non-native species are established, natural disturbance such as fire, flooding and erosion support further spread of these aggressive species into newly disturbed areas. Presently, kochia (*Bassia scoparia*), Siberian elm (*Ulmus pumila*), Scotch thistle (*Onopordum acanthium*), woolly mullein (*Verbascum thapsus*), tamarisk (*Tamarix chinensis*) and Russian olive (*Elaeagnus angustifolia*), are the most prevalent and threatening of the exotic plant species found in the Park.

The proposed project would include constructing a trail that would require the removal of some vegetation. Long-term use of the trail would likely prohibit re-growth of this vegetation. These actions are considered to have measurable effects; therefore, the topic of vegetation will be carried forward for further analysis.

## Visitor Use and Experience

According to *2006 Management Policies*, the enjoyment of park resources and values by people is part of the fundamental purpose of all park units (NPS 2006). The NPS is committed to providing appropriate, high quality



opportunities for visitors to enjoy the parks, and will maintain within the parks an atmosphere that is open, inviting, and accessible to every segment of society. Further, the National Park Service will provide opportunities for forms of enjoyment that are uniquely suited and appropriate to the superlative natural and cultural resources found in the parks. The National Park Service *2006 Management Policies* also state that scenic views and visual resources are considered highly valued associated characteristics that the National Park Service should strive to protect (NPS 2006).

Visitation at Pecos National Historical Park has remained fairly level over the last decade. Over the next 15-20 years, visitation could grow by as much as 10%. Approximately 40,000 people visited the Park in 2005. The busiest months for visitation to the Park are July and August.

Pecos National Historical Park was expanded on November 8, 1990, by Congress to include the Glorieta Battlefield Unit, which was added to: "...preserve and interpret the Battle of Glorieta Pass and to enhance visitor understanding of the Civil War and the Far West..." (PL 101-536, 104 Stat. 2368). Currently, the only public access to the Glorieta Battlefield Unit of the Park is by participating in scheduled tours guided by Park Rangers and volunteers. Guided tours offer the only means of on-site interpretation and limited information on the battle is provided at the visitor center. Due to limitations in park staff availability, guided tours are offered only on a limited basis.

The proposed project will be in close proximity to residential communities and will increase visitor opportunities and improve visitor enjoyment; therefore, this topic is carried forward for further analysis.

## Park Operations

Changes that may require a new level of maintenance or staffing, or that may affect existing facilities are considered under this topic. The Pecos National Historical Park superintendent is ultimately responsible for park operations management. In 2006, the park employed a staff of 20 to manage operations including visitor services and facilities, natural and cultural resource management and preservation, emergency medical services, law enforcement, search and rescue operations, facilities management and maintenance and administrative duties. The Divisions most involved with the Glorieta Battlefield Unit and visitor and employee area use are the Facilities Management/Cultural Resources Division (road, trail and restroom maintenance); Natural Resource Management and Visitor Protection Division (visitor safety and resource protection); and the Division of Interpretation (interpretive programs and wayside exhibits). NPS maintenance staff and park rangers currently provide trail repair, maintenance, and visitor safety measures for 1.5 miles of park trails. Currently one park ranger may occasionally patrol the proposed project area by foot. The park maintenance staff repairs signs, and corrects erosion and design deficiencies on existing trail tread on an as needed basis within the park.

The trail, trailhead parking and trailhead access road will be located on lands managed by the National Park Service. The National Park Service will perform increased maintenance and safety patrols of these areas, mostly on an as-needed basis, or as budgets and priorities allow. This would have a measurable effect to Park staff, and therefore, this topic has been carried forward for further analysis.

## Impact Topics Dismissed From Further Analysis

Some impact topics have been dismissed from further consideration, as listed below. The rationale for dismissing these specific topics is stated for each resource.

### Wildlife

According the National Park Service *2006 Management Policies*, the National Park Service strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of animals (NPS 2006). The project area is primarily comprised of pinyon-juniper forests and small stands of rabbitbrush which support a variety of wildlife.

An inventory of mammals, reptiles, birds, and invertebrates occurring in and around the Pecos Unit of the Park was completed in 1996 and a similar floral survey was completed in 1995 (NPS 1996). A localized inventory of the Glorieta Unit is set for 2007 or 2008, however the Glorieta Unit is less than three miles from, and essentially identical in habitat



makeup to that of the Pecos Unit. For the purposes of this document, floral and faunal resources are expected to be identical.

The most common small mammals found in the area include cottontail rabbit, black-tailed jackrabbit, Colorado chipmunk, rock squirrel, long-tail weasel, Botta’s pocket gopher, western harvest mouse, deer mouse, piñon mouse, Mexican wood rat and three species of bats. Large mammals documented in the park include coyote, elk, mule deer, raccoon, gray fox, beaver, muskrat, mountain lion, black bear, and bobcat. Reptiles included five species of snake and three species of lizard. Two amphibians are woodhouse toad and canyon tree frog. Invertebrates common in the park include ground and darkling beetles, western harvester ants, camel crickets, scaly bush crickets, wolf spiders, gnaphosid, and ground-dwelling crab spiders.

Bird surveys conducted in the park included one by Mukai of University of Arizona, who reported 109 bird species on the Forked Lightning and Los Trigos Ranches. Of the total, 24 species were documented year-round; 68 were documented in summer, 7 were transient, and 10 were winter residents. Summer residents included hummingbird, gray flycatcher, violet-green swallow, canyon wren, solitary vireo, western tanager, and vesper sparrow. Year-round residents included American kestrel, hairy woodpecker, black-billed magpie, common raven, plain titmouse, mountain bluebird, and house finch. There was breeding evidence for 51 species, including great horned owl, northern flicker, ash-throated flycatcher, scrub jay, black-throated gray warbler, lark sparrow, and lesser goldfinch (Mukai 1989). Of the birds covered under the Federal *Migratory Bird Treaty Act*, none are expected to be affected during their nesting season by trail building activities or subsequent trail use.

Construction and use of the trail would disturb wildlife and wildlife habitat; however, given the proximity of the proposed trail to the developed residential areas adjoining the park, this impact is expected to be minor. Any disturbed areas created by construction activities outside of the new trail corridor, such as any staging areas, would be re-vegetated and rehabilitated following construction activities.

Construction activities on the trail, work crews, and the placement of staging (material) areas would also have temporary adverse impacts on wildlife to a minor degree; however, these effects would last only as long as the construction period. Dust and noise would increase which may disturb wildlife in the general area, and would be temporary, lasting only as long as construction.

Because the effects to wildlife and wildlife habitat from the proposed project are minor to negligible, the topic of wildlife has been dismissed from further consideration.

**Special Status Species**

The Endangered Species Act of 1973 requires examination of impacts on all federally-listed threatened, endangered, and candidate species. Section 7 of the Endangered Species Act requires all federal agencies (or designated representative) to consult with the U.S. Fish and Wildlife Service to ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of listed species or critical habitats. In addition, the 2006 *Management Policies* and Director’s Order #77: *Natural Resources Protection* requires the National Park Service to examine the impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive wildlife and vegetation species (NPS 2006).

For the purposes of this analysis, a list of federally listed species that may occur in or near the project area in Pecos NHP (Santa Fe County) was obtained from the current US Fish & Wildlife Service (USFWS) website. A survey of the project area to determine the presence of suitable habitat for listed special status species was then conducted by research personnel from Natural Heritage New Mexico. Survey results indicate that habitats in the project area are not likely to support listed species and their presence in the park is transient and casual at best.

Federally listed species include:

**Federally Listed Species (Santa Fe County)**

1	Bald Eagle	<i>Haliaeetus leucocephalus</i>	AD, T	AD – Proposed Delisting
2	Black-Footed Ferret	<i>Mustela nigripes</i>	E	

3	Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	T	T – Threatened C – Candidate E – Endangered PT – Proposed Threatened
4	Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	E	
5	Rio Grande silvery minnow	<i>Hybognathus amarus</i>	E	
6	Western Yellow-Billed Cuckoo	<i>Coccyzus americanus occidentalis</i>	C	

1. **Bald Eagle:** American bald eagles are winter residents and occasional nesters in New Mexico. The eagle requires fish-producing waters and large riparian trees to successfully nest and produce young. During the winter months they congregate in areas with high fish densities and waterfowl. The Bald Eagle is known to winter in the Pecos River drainage and individuals have been seen along the Pecos River in the Park in winter months. Bald eagles may use large cottonwood trees in the riparian areas along the Pecos River or Glorieta Creek. Suitable habitat for bald eagles is not located within the project area; therefore the proposed action will not affect the bald eagle or its habitat.
2. **Black-footed Ferret:** There are no prairie dog towns in or near the park, therefore there is no potential for ferret habitat in the Park as they are obligates of prairie dog towns. Due to the absence of suitable habitat for this species, the proposed action will not affect the Black-footed Ferret or its habitat.
3. **Mexican Spotted Owl:** Suitable habitat for spotted owl nesting and roosting is composed of mixed conifer and/or Douglas-fir vegetation types. Understory characteristics demonstrate multi-layered, uneven-aged conifer and hardwoods ranging in age from 20-70 years. Live trees are 8 inches dbh or greater with at least 40% canopy closure and are located on slopes of 40% or greater. Dead and down attributes include a variety of age class of snags and presence of large down logs. Suitable habitat for the Mexican spotted owl is not located within the project area; therefore the proposed action will not affect the Mexican spotted owl or its habitat.
4. **Southwestern Willow Flycatcher:** The southwestern willow flycatcher breeds in dense riparian habitats along rivers, streams, or other wetlands. The vegetation can be dominated by dense growths of willows (*Salix* sp.) or other shrubs and medium-sized trees. One of the most important characteristics of the habitat appears to be the presence of dense vegetation, usually throughout all vegetation layers present. The park would support marginal habitat along riparian corridors for the species, however the project area does not support this habitat. Due to the absence of suitable habitat for this species, the proposed action will not affect the Southwestern willow flycatcher or its habitat.
5. **Rio Grande Silvery Minnow:** The Rio Grande silvery minnow has historically been distributed over thousands of miles of the Rio Grande and Pecos Rivers. Today, somewhere between 70 - 95% of this last remnant population of silvery minnow is located in the short stretch of the Rio Grande River between San Acacia Dam and Elephant Butte Reservoir. This habitat does not occur within the project area. Due to the absence of suitable habitat for this species, the proposed action will not affect the Rio Grande Silvery Minnow or its habitat.
6. **Western Yellow-billed Cuckoo:** The western yellow-billed cuckoo is an obligate riparian nester—they only breed in streamside forests, especially those dominated by willow and cottonwood stands. Habitat occurs within relatively large patches, usually 25-100 acres in extent. Habitat in the park is marginal because of the relatively small riparian land area and no habitat of this type exists within the project area. Due to the absence of suitable habitat for this species, the proposed action will not affect the Western yellow-billed cuckoo or its habitat.

In a written response, dated April 4, 2007, to the Park's initial project scoping letter, the USFWS stated "it is the responsibility of the Federal agency or its designated representative to determine if a proposed action *may affect* endangered, threatened or proposed species, or designated critical habitat, and if so, consult with us further." The Park (National Park Service) has determined that no federally listed threatened, endangered, proposed or candidate species will be affected by the proposed action and no designated critical habitats lie within or near the project area, therefore no further consultation with the US FWS is required.

For the purposes of this analysis, a list of state listed species that may occur in or near the project area in Pecos NHP (Santa Fe County) was obtained from the current New Mexico Department of Game and Fish website. The survey conducted by research personnel from Natural Heritage New Mexico also examined the project area for the presence of suitable habitat for State listed special status species. Listed State species and survey results are shown in the following table.

State of New Mexico Species of Concern - Santa Fe County March 2, 2007					
<b>STATUS:</b> T – Threatened, E – Endangered, s – Sensitive, F - Addressed As Federally Listed Species					
<b>PROJECT AREA HABITAT:</b> HN – Habitat NOT found in Project Area; HF – Habitat FOUND in project area					
<b>Affect:</b> N – No Effect, NL – If present, likely to affect but not likely to adversely effect, LA – Likely to adversely effect,					
Species	Status	Species Habitat	Project Area Habitat	Affect	Notes (Survey Results)
1 Bat, Big-eared, Townsend's, Pale <i>Corynorhinus townsendii pallascens</i>	s	Semi-desert shrublands, pinon-juniper woodlands, and open montane forests. Frequently associated with caves and abandoned mines for day roosts and hibernacula but will also use abandoned buildings and crevices on rock cliffs for refuge.	HF	NL	Unlikely that the proper roosting habitat is present at the trail site. If present, the proposed action could affect a population of the species, but would be so small and localized to a small area of the park, that it would have few measurable consequences.
2 Bat, Myotis, Fringed <i>Myotis thysanodes thysanodes</i>	s	Mountainous pine, oak, and pinon-juniper to desert scrub but seem to prefer grassland areas at intermediate elevations. Roost in caves, mine tunnels, rock crevices, and old buildings. Extensive use of both live and dead trees in pinyon-juniper habitats.	HF	NL	Unlikely that the proper roosting habitat is present at the trail site. If present, the proposed action could affect a population of the species, but would be so small and localized to a small area of the park, that it would have few measurable consequences.
3 Bat, Myotis, Long-legged <i>Myotis volans interior</i>	s	Inhabitant of forested areas, where it prefers high, open woods and mountainous terrain. Rare in the Trans-Pecos. Probably only a summer resident. Roosts in buildings, rock crevices, and trees.	HN	N	Unlikely that the proper roosting habitat is present at the trail site. Myotis volans is usually found at higher elevations in ponderosa pine and higher vegetation types.
4 Bat, Myotis, Small-footed, W. <i>Myotis ciliolabrum melanorhinus</i>	s	Relatively common in ponderosa pine forests and pinon-juniper woodlands. Roost in trees, buildings, rock face crevices, and ground fissures. Caves and mines used as night roosts. Probably hibernate singly in local mines and caves. Commonly associated with willows along stream sides in cottonwood and rabbitbrush riparian habitats.	HF	NL	Unlikely that the proper roosting habitat is present at the trail site. If present, the proposed action could affect a population of the species, but would be so small and localized to a small area of the park, that it would have few measurable consequences.
5 Bat, Myotis, Yuma <i>Myotis yumanensis yumanensis</i>	s	Usually associated with permanent sources of water, typically rivers and streams. Occurs in riparian, arid shrublands and deserts, and forest areas. Roost in bridges, buildings, cliff crevices, caves, mines, & trees.	HF	NL	Unlikely that the proper roosting habitat is present at the trail site. Needs permanent water nearby, which is not present at the creek. If present, the proposed action could affect a population of the species, but would be so small and localized to a small area of the park, that it would have few measurable consequences.
6 Chub, Rio Grande <i>Gila pandora</i>	s	Cool water reaches the Rio Grande & Pecos Rivers (& tributaries) in northern NM.	HN	N	Habitat not present at this site.

7	Crane, Whooping <i>Grus americana</i>	E	Desert riparian, deciduous woodland, marsh. Especially cottonwood woodlands, where desert streams provide sufficient moisture for narrow tree/shrub band along margins. Forage in agricultural fields and valley pastures where there is waste grain or sprouting crops. Roost on sand bars in the Rio Grande.	HN	N	Habitat not present at this site. No longer occurs in New Mexico.
8	Eagle, Bald <i>Haliaeetus leucocephalus alascanus</i>	T / F	See Federally listed species.	*	*	
9	Falcon, Peregrine <i>Falco peregrinus anatum</i>	T	Douglas fir, Hemlock-Sitka spruce, redwood, ponderosa pine, larch/white pine, lodgepole pine, fir-spruce, aspen (hardwoods), chaparral, and pinyon-juniper forest types. Breed on cliffs in wooded/forested habitats, with large "gulfs" of air nearby where they can forage. Hunt in croplands, meadows, river bottoms, marshes and lakes.	HF	NL	If present, the proposed action could affect a population of the species, but would be so small and localized to a small area of the park, that it would have few measurable consequences.
10	Ferret, Black-footed <i>Mustela nigripes</i>	s / F	See Federally listed species.	*	*	No wild populations are known to reside in New Mexico.
11	Flycatcher, Willow, SW. <i>Empidonax traillii extimus</i>	E / F	See Federally listed species.	*	*	
12	Fox, Red <i>Vulpes vulpes fulva; macroura</i>	s	Common in open woodlands, pasturelands, riparian, and agricultural lands. Favors mixture of vegetation types occurring in small mosaics with good development of ground cover. Do well on margins of urbanized areas. Common in open space and other undeveloped areas adjacent to cities.	HF	NL	Not likely present in this habitat. Status and threats to the red fox are so poorly known in the state that little can be said as to their need for special protection. If present, the proposed action could affect a population of the species, but would be so small and localized to a small area of the park, that it would have few measurable consequences.
13	Goshawk, Northern <i>Accipiter gentilis atricapillus; apache</i>	s	Locally in mature, closed canopied coniferous forests of mountains and high mesas. Known to use Juniper and Wetland habitats. Large trees (> 18 " dia.) supply large snags and downed logs important to Goshawk prey, perches and nest sites.	HN	NL	Habitat not present at this site.
14	Hummingbird, Violet-crowned <i>Amazilia violiceps ellioti</i>	T	Riparian woodlands at low to moderate elevations. In New Mexico, the violet-crowned hummingbird seeks only well-developed riparian areas of the Guadalupe Canyon in summer	HN	N	Habitat not present at this site.
15	Marmot, Yellow-bellied <i>Marmota flaviventris luteola; obscura</i>	s	Common above 8,000 ft in alpine tundra, subalpine and montane meadows. Range into foothills and canyon country on either side of mountains where rock outcrops or boulders exist along with suitably productive and succulent vegetation.	HN	N	Habitat not present at this site or elevation.
16	Marten, American <i>Martes americana origenes</i>	T	Spruce-fir forests and marginal Alpine habitat.	HN	N	Habitat not present at this site.
17	Mountainsnail, Socorro <i>Oreohelix neomexicana</i>	s	Occurs in vicinity of limestone cliffs in thick, moist litter derived mainly from fallen leaves of pinyon pine, one-seeded juniper, and various shrubs.	HN	N	Habitat not present at this site.
18	Owl, Boreal <i>Aegolius funereus</i>	T	Primarily a bird of high elevation, mature and old-growth spruce-fir forests.	HN	N	Habitat not present at this site.

19	Owl, Spotted, Mexican <i>Strix occidentalis lucida</i>	s / F	See Federally listed species.	*	*	
20	Peaclam, Lilljeborg's <i>Pisidium lilljeborgi</i>	T	Characteristic of lakes, occurring at higher latitudes and altitudes. Surrounding habitats include rocky talus, stands of Engelmann spruce and subalpine fir, and grass-sedge-forb communities.	HN	N	Habitat not present at this site.
21	Plover, Mountain <i>Charadrius montanus</i>	S	Strongly associated with sites of heaviest grazing pressure to the point of excessive surface disturbance. Attracted to man-made landscapes (e.g., sod farm, cultivated fields) that mimics natural habitat associations, or sites with grassland characteristics (alkali flats, other agricultural lands). Nesting sites dominated by short vegetation and bare ground, often with manure piles or rocks nearby.	HN	N	Habitat not present at this site.
22	Prairie Dog, Gunnison's <i>Cynomys gunnisoni gunnisoni</i>	S	Grasslands from low valleys to montane meadows.	HF	N	There are no prairie dog towns in or near the park.
23	Ptarmigan, White-tailed <i>Lagopus leucurus altipetens</i>	E	Alpine tundra and timberline habitats, which in New Mexico are mainly above 10000 feet.	HN	N	Habitat not present at this site.
24	Ringtail <i>Bassariscus astutus arizonensis</i>	S	Montane habitats, but also in lowlands in rough, rocky country. Sycamore, and rabbitbrush riparian habitats and in the steep cliffs and arroyos that drain to the east. Particularly associated with rocky habitat types in New Mexico.	HF	NL	Ringtail has been documented in the park. If present at the project site, the proposed action could affect a population of the species, but would be so small and localized to a small area of the park, that it would have few measurable consequences.
25	Shrike, Loggerhead <i>Lanius ludovicianus excubitorides</i>	S	Agricultural lands on prairies to montane meadows, nesting in sagebrush areas, desert scrub, pinyon-juniper woodlands, and woodland edge. Open country interspersed with improved pastures, grasslands, and hayfields is primary shrike habitat throughout its range.	HF	NL	Presence is possible, but usually found in more grassland, shrubland habitats. If present, the proposed action could affect a population of the species, but would be so small and localized to a small area of the park, that it would have few measurable consequences.
26	Skunk, Spotted Western <i>Spilogale gracilis</i>	S	Sycamore, cottonwood, and rabbitbrush riparian habitats.	HF	NL	Presence is possible. If present, the proposed action could affect a population of the species, but would be so small and localized to a small area of the park, that it would have few measurable consequences.
27	Snail, Disc, Striate, Cockerell's <i>Discus shimeki cockerelli</i>	S	Terrestrial snail found at elevations between 7,000 feet and 12,000 feet. Typically found under stones, logs, and pieces of wood. Often associated with woody debris of spruce, fir, and/or aspen.	HN	N	Habitat not present at this site. Typically found at much higher elevations.
28	Sparrow, Baird's <i>Ammodramus bairdii</i>	T	Migrant in NM, occurring primarily in the eastern plains and southern lowlands, & may winter in some locales. Grassland species.	HN	N	Habitat not present at this site.
29	Swift, Black <i>Cypseloides niger borealis</i>	S	High inaccessible cliffs with exposed rock near permanent water. Forage aerially over all wetland and aquatic types.	HN	N	Habitat not present at this site.



30	Tern, Least <i>Sterna antillarum athalassos</i>	E	Colonially-nesting water bird. Prefer a flat, sandy substrate essentially devoid of vegetation, on which they place their nest scrapes. Provision of proper breeding conditions is essential, this involving level, sparsely-vegetated ground near water, relative freedom from terrestrial predators and human disturbance, and an adequate prey base.	HN	N	Habitat not present at this site.
31	Vireo, Gray <i>Vireo vicinior</i>	T	Open woodlands/shrublands featuring evergreen trees and shrubs of various kinds. In NM, the gray vireo is most often found in arid juniper woodlands on foothills and mesas, these most often associated with oaks and usually in habitat with a well-developed grass component Occurs in NM only in the warmer months (April-September).	HN	N	
32	Vole, Heather <i>Phenacomys intermedius intermedius</i>	s	Stands of spruce, fir, lodgepole, aspen, and ponderosa pine, and grassy meadows in montane forests, subalpine forests, and alpine tundra	HN	N	Habitat not present at this site.

In a written response, dated March 27, 2007, to the Park's initial project scoping letter, the New Mexico Department of Game and Fish stated "...regarding the above referenced project, the Department of Game and Fish does not anticipate significant impacts to wildlife or sensitive habitats". Therefore no further consultation with NM F&G is required.

Summary - Special Status Species

No federally listed threatened, endangered, proposed or candidate species are known or likely to inhabit the proposed project area and no designated critical habitats lie within or near the project area.

No state listed species of concern are known to inhabit the proposed project area; however some state species of concern could potentially be present in the project area based on the presence of suitable habitat. If present, the proposed action could potentially affect a population of one or more of those species, but the effects would be so small and localized to a small area of the park, that they would have few measurable consequences.

Because no federally listed threatened, endangered, proposed or candidate species are known or likely to inhabit the proposed project area; no designated critical habitats lie within or near the project area; no state listed species of concern are known to inhabit the proposed project area; and any effects to state listed species if present would likely have few measurable consequences, the topic of special status species was dismissed from further analysis.

**Water Resources**

National Park Service policies require protection of water quality consistent with the Clean Water Act. The purpose of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters". To enact this goal, the U.S. Army Corps of Engineers has been charged with evaluating federal actions that result in potential degradation of waters of the United States and



issuing permits for actions consistent with the Clean Water Act. The U.S. Environmental Protection Agency also has responsibility for oversight and review of permits and actions, which affect waters of the United States.

The proposed project area does not contain surface waters, and is mostly dry, except for periodic runoff during storm events. To assist with erosion and water quality, disturbed areas would be re-vegetated and re-contoured following construction. Erosion of soils is further addressed under the topic Geology and Soils, which is carried forward for further analysis. Water quality, water quantity, and drinking water are not expected to be affected by the project.

Because the project results in negligible effects to water resources, this topic has been dismissed from further consideration.

## **Wetlands**

For regulatory purposes under the Clean Water Act, the term wetlands means "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas." Executive Order 11990 *Protection of Wetlands* requires federal agencies to avoid, where possible, adversely impacting wetlands. Further, Section 404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers to prohibit or regulate, through a permitting process, discharge or dredged or fill material or excavation within waters of the United States. National Park Service policies for wetlands as stated in *2006 Management Policies* and Director's Order #77-1: *Wetlands Protection*, strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands (NPS 2006, NPS 2002a). In accordance with DO 77-1 *Wetlands Protection*, proposed actions that have the potential to adversely impact wetlands must be addressed in a Statement of Findings for wetlands.

No wetlands are located in the project area; therefore, a Statement of Findings for wetlands will not be prepared, and the topic of wetlands has been dismissed from further consideration.

## **Floodplains**

Executive Order 11988 *Floodplain Management* requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. The National Park Service under *2006 Management Policies* and Director's Order #77-2: *Floodplain Management* will strive to preserve floodplain values and minimize hazardous floodplain conditions. According to Director's Order #77-2: *Floodplain Management*, if certain types of construction are located within a 100-year floodplain, preparation of a statement of findings for floodplains is required (NPS 2006, NPS 2002b).

No floodplains are located in the project area; therefore, a Statement of Findings for floodplains will not be prepared, and the topic of floodplains has been dismissed from further consideration.

## **Wilderness**

According to the National Park Service's *2006 Management Policies*, the National Park Service will evaluate all lands it administers for their suitability for inclusion within the national wilderness preservation system, and for those lands that possess wilderness characteristics, no action will be taken that would diminish wilderness suitability (NPS 2006). According to the 1964 Wilderness Act which established the national wilderness preservation system, wilderness is defined as, "...an area where the earth and its community of life are untrammelled by man, where man himself is a visitor who does not remain."

There is no congressionally designated wilderness in or near the project area; therefore, the topic of wilderness has been dismissed from further consideration.

## Historic Structures

Section 106 of the National Historic Preservation Act, as amended in 1992 (16 USC 470 *et seq.*); the National Park Service's Director's Order #28: *Cultural Resource Management Guideline*; and National Park Service *2006 Management Policies* (NPS 2006) require the consideration of impacts on historic properties that are listed or eligible to be listed in the National Register of Historic Places. The National Register is the nation's inventory of historic places and the national repository of documentation on property types and their significance. The above-mentioned policies and regulations require federal agencies to coordinate consultation with State Historic Preservation Officers regarding the potential effects to properties listed on or eligible for the National Register of Historic Places.

The National Park Service, as steward of many of America's most important cultural resources, is charged to preserve historic properties for the enjoyment of present and future generations. Management decisions and activities throughout the National Park Service must reflect awareness of the irreplaceable nature of these resources. The National Park Service will protect and manage cultural resources in its custody through effective research, planning, and stewardship and in accordance with the policies and principles contained in the *2006 Management Policies* and Director's Order #28: *Cultural Resource Management* (NPS 1998).

There are several historic features and one historic site located in the project area. The two intact features are the windmill on top of windmill hill and a cemetery. The other is the remains of a small shed that has collapsed and a historic trash dump.

The trail has been redirected to avoid these resources; therefore, the topic of historic structures has been dismissed from further consideration.

## Archeological Resources

In addition to the National Historic Preservation Act and the National Park Service *2006 Management Policies* (NPS 2006), the National Park Service's Director's Order #28A: *Archeology* (NPS 2004), affirms a long-term commitment to the appropriate investigation, documentation, preservation, interpretation, and protection of archeological resources inside units of the National Park System. As one of the principal stewards of America's heritage, the National Park Service is charged with the preservation of the commemorative, educational, scientific, and traditional cultural values of archeological resources for the benefit and enjoyment of present and future generations. Archeological resources are nonrenewable and irreplaceable, so it is important that all management decisions and activities throughout the National Park Service reflect a commitment to the conservation of archeological resources as elements of our national heritage.

An intensive cultural resource inventory was conducted for the proposed undertaking in order to fulfill requirements of Section 106 of the National Preservation Act of 1966 (P.L. 89-665) as amended and 36 CFR, part 800. The project research design was to identify all cultural resources within the project area of potential effect (APE). The APE was a 100 meter corridor along the proposed trail. It totaled approximately 120 acres. Subsurface testing of cultural resources that might be located was not authorized under the New Mexico State Survey permit.

The broad project area was found to contain several prehistoric sites. An archeological and cultural resource survey was conducted by a contract archeologist during March of 2007 and his report identified 7 prehistoric features, one Archaic Camp site, several lithic scatters and one milling feature.

The trail has been redirected to avoid these resources; therefore, the topic of archaeological resources has been dismissed from further consideration.

## Cultural Landscapes

According to the National Park Service's Director's Order #28: *Cultural Resource Management Guideline*, 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 (NPS 1998). In 1998, a cultural landscape survey was conducted in Pecos National Historical Park, and five potential cultural landscapes were identified.

None of these resources are in the project area; therefore, the topic of cultural landscapes has been dismissed from further consideration.

## Ethnographic Resources

National Park Service Director's Order #28: *Cultural Resource Management* 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 (NPS 1998). According to DO-28 and Executive Order 13007 on sacred sites, the National Park Service should try to preserve and protect ethnographic resources.

No ethnographic resources are known to exist in the proposed project area. A scoping letter was mailed to the tribes, and no response was received. For these reasons, this topic has been dismissed from further consideration.

## Museum Collections

According to Director's Order #24: *Museum Collections Management*, the National Park Service requires the consideration of impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript material), and provides further policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, National Park Service museum collections (NPS 2004c).

The proposed project will not disturb any curatorial facilities or contribute any additional collections to curatorial facilities; therefore museum collections at Pecos National Historical Park will not be affected by the proposed project, and this topic has been dismissed from further analysis.

## Air Quality

The Clean Air Act of 1963 (42 U.S.C. 7401 *et seq.*) was established to promote the public health and welfare by protecting and enhancing the nation's air quality. The act establishes specific programs that provide special protection for air resources and air quality related values associated with National Park Service units. Section 118 of the Clean Air Act requires a park unit to meet all federal, state, and local air pollution standards. Pecos National Historical Park is designated as a Class II air quality area under the Clean Air Act. A Class II designation indicates the maximum allowable increase in concentrations of pollutants over baseline concentrations of sulfur dioxide and particulate matter as specified in Section 163 of the Clean Air Act. Further, the Clean Air Act provides that the federal land manager has an affirmative responsibility to protect air quality related values (including visibility, plants, animals, soils, water quality, cultural resources, and visitor health) from adverse pollution impacts.

Construction activities such as hauling materials and operating equipment could result in temporary increases of vehicle exhaust, emissions, and fugitive dust in the general project area. Any exhaust, emissions, and fugitive dust generated from construction activities would be temporary and localized, and would likely dissipate rapidly because air stagnation at Pecos National Historical Park is rare. Overall, the project could result in a negligible degradation of local air quality, and such effects would be temporary, lasting only as long as construction activities are being conducted.

The Class II air quality designation for Pecos National Historical Park would not be affected by the proposal; therefore, air quality has been dismissed from further consideration.

## **Soundscape Management**

In accordance with *2006 Management Policies* and Director's Order #47: *Sound Preservation and Noise Management*, an important component of the National Park Service's mission is the preservation of natural soundscapes associated with national park units (NPS 2006). 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 frequencies, magnitudes, and durations 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.

The soundscape within the Pigeon's Ranch sub-units of Pecos National Historical Park is comprised of both manmade and natural sounds. Because the proposed project is in proximity to residential houses, there are man-made sounds in the area such as vehicular traffic on nearby roads; climate controls such as heating or air conditioning units; lawn mowers and other residential-type machinery; people; and aircraft. Natural sounds in the area include birds, wildlife, and wind.

This project would not contribute to long-term impacts to the soundscape at Pecos National Historical Park. The proposed project would likely have temporary impacts to the soundscape while construction activities are conducted, such as human-caused sounds from equipment, vehicular traffic, and people. Any sounds generated during the construction of the proposed trail would be temporary, lasting only as long as the activity is producing the sounds, and would have a negligible adverse impact on visitors and employees. Therefore, the topic of soundscape management was dismissed from further consideration.

## **Lightscape Management**

In accordance with *2006 Management Policies*, the National Park Service strives to preserve natural ambient landscapes, which are natural resources and values that exist in the absence of human caused light (NPS 2006). Pecos National Historical Park strives to limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements. The Park also strives to ensure that all outdoor lighting is shielded to the maximum extent possible, to keep light on the intended subject and out of the night sky. The residential communities adjacent to the Park are the primary sources of light at the Park.

No exterior lighting is proposed for this project and no impacts to the lightscape are expected; therefore, this topic has been dismissed from further consideration.

## **Socioeconomics**

The proposed action would neither change local and regional land use nor appreciably impact local businesses or other agencies. Implementation of the proposed action could provide a negligible beneficial impact to the economies of nearby Pecos due to minimal increases in revenues for local businesses generated from restoration activities and increased long-term visitation. Any increase in workforce revenue, however, would be temporary and negligible, lasting only as long as the restoration activities occur.

Because the impacts to the socioeconomic environment would be negligible, this topic has been dismissed from further consideration.

## **Prime and Unique Farmlands**

The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider adverse effects to prime and unique farmlands that would result in the conversion of these lands to non-agricultural uses. Prime or unique farmland is classified by the U.S. Department of Agriculture's Natural Resources Conservation Service, and is defined as soil that particularly produces general crops such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops such as fruits, vegetables, and nuts. In order to be considered prime and unique, the farmland must be irrigated.

The Park does not irrigate any of its lands; and, therefore does not contain prime or unique farmlands. Therefore, the topic of prime and unique farmlands has been dismissed from further consideration.

## **Indian Trust Resources**

Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by the Department of 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 States to protect tribal lands, assets, resources, and treaty rights, and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes. There are no Indian trust resources at Pecos National Historical Park.

The lands comprising the Park are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Therefore, the project would have no effects on Indian trust resources, and this topic has been dismissed from further consideration.

## **Environmental Justice**

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

Because the newly constructed trail would be available for use by all people regardless of race or income, and the construction workforces would not be hired based on their race or income, the proposed action would not have disproportionate health or environmental effects on minorities or low-income populations or communities. Therefore, environmental justice has been dismissed from further consideration.

# **ALTERNATIVES CONSIDERED**

On February 13, 2007 an interdisciplinary team of National Park Service employees met for the purpose of developing project alternatives. This meeting resulted in the definition of project objectives as described in the *Purpose and Need*, and a list of alternatives that could potentially meet these objectives. A total of three action alternatives and the no action alternative were originally identified for this project. Of these, two of the action alternatives were dismissed from further consideration for various reasons, as described later in this chapter. One action alternative and the no action alternative are carried forward for further evaluation in this Environmental Assessment. A summary table comparing alternative components is presented at the end of this chapter.

## **Alternatives Carried Forward**

### **Alternative A – No Action**

Under this alternative, a new interpretive foot trail from the Old Denver Highway to Arrowhead Ridge and Windmill Hill would not be constructed. Should the No-Action Alternative be selected, the National Park Service would continue to manage the Pigeon's Ranch sub-unit of the Glorieta National Battlefield unit of Pecos National Historical Park without modifications or improvements to visitor access on Arrowhead Ridge and Windmill Hill.

## **Alternative B – Construct Interpretive Foot Trail from the Old Denver Highway to Arrowhead Ridge and Windmill Hill**

Under this alternative, a new interpretive foot trail would be constructed from the Old Denver Highway to Arrowhead Ridge and on to Windmill Ridge (see Figure 1). This new trail would be approximately 2.25 miles in length, and would be a natural, non-paved trail. Appropriate signage would be posted along the trail to minimize social trailing and add to the interpretive needs. Volunteer assistance would be used whenever practical and available.

The trail would be managed according to current policies of the National Park Service (NPS). The trail would be managed to allow for hiking use only, dogs would be permitted on a leash and bikes and horses would not be permitted. The NPS would maintain the trail and conduct safety patrols, as funding and priorities permit.

The new trail would be designed to minimize soil and vegetation impacts and offer visitors an unparalleled interpretive experience. Safety considerations would also be an important element of designing the proposed trail. In designing the trail route, any existing social trails would be used to the extent feasible to minimize unnecessary environmental impacts.

This alternative also proposes constructing a trailhead parking area and improving the current access road to the proposed parking area. From the visitor center, visitors would be directed along a portion of the Old Denver Highway (Route 66) which parallels current I-25. A trailhead parking area would be established at or near the terminus of this road, and the new interpretive foot trail would be constructed from the parking area to Arrowhead Ridge and on to Windmill Ridge to interpret the battlefield. An introductory/orientation wayside exhibit would be placed at the trailhead. In addition to providing an introduction and context for the battle, this wayside exhibit would orient people to the loop trail, its length, degree of difficulty, and what they can expect to experience along the route.

The trailhead parking area and access road would consist of either new or recycled asphalt and would be located either exclusively on NPS lands or on a combination of NPS lands and Santa Fe County roadways. The parking area would hold approximately 10 vehicles and a trash receptacle and toilets would also be provided.

Access to the trailhead and parking area would be through a locked gate located where the access road (Old Denver Highway) crosses entirely onto NPS land. The gate would be self closing and secured with a self locking combination lock. The lock combination could be issued on a case by case basis to visitors at the Visitor Center upon payment of the Park entrance fee. Occasionally, on very busy days, the parking area may be full with overflow parking placed inside the gate on the side of the roadway.

The trail, trailhead and access road will be in close proximity to residential communities but will not infringe on private property. People from these communities are expected to be the most regular visitors to this area of the Park. As the adjoining neighborhoods develop and increase in size, the number of people using the trailhead and trail is expected to increase.

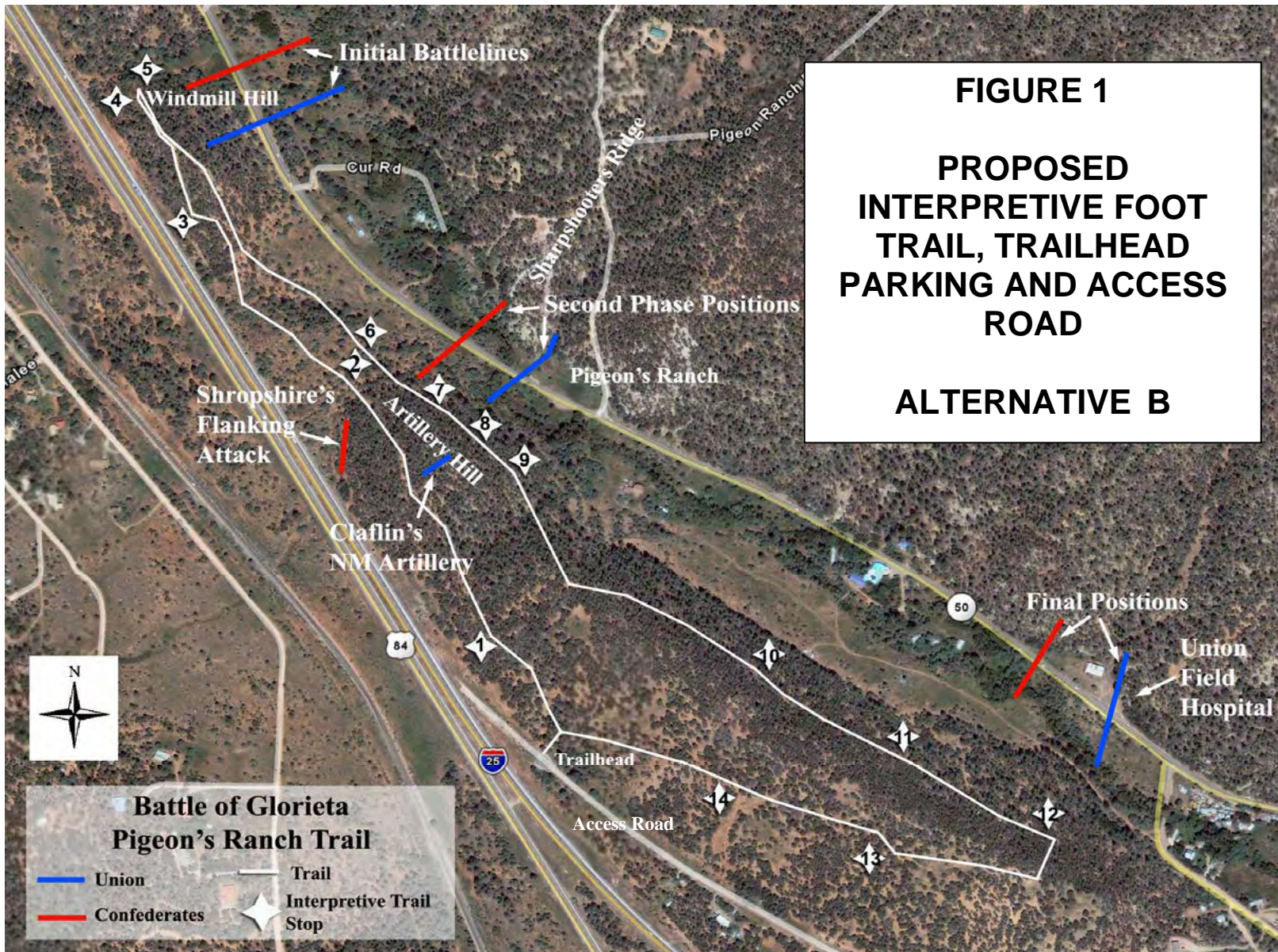
To implement this alternative, a portion of the trailhead area would be temporarily used for construction staging, material stockpiling, portable restroom, and equipment storage. Staging would be located in a previously disturbed area of the trailhead, and fenced or taped off from visitor contact. Exact location of



the staging area will be determined following final trail design. The staging area would be re-contoured to its previous manner following completion of restoration activities.

This alternative is based on preliminary designs and the best information available at the time of this writing. Specific distances, areas, and layouts used to describe the alternative are only estimates and could change during final design. If changes during final design are not consistent with the intent and effects of the selected alternative, then additional compliance would be completed, as appropriate.

DRAFT



## Alternatives Considered and Dismissed

The following alternatives were considered for project implementation, but were ultimately dismissed from further analysis in this Environmental Assessment. Reasons for their dismissal are provided in the following alternative descriptions.

### **Alternative C - Construct Interpretive Foot Trail from New Mexico Highway 50 below Sharpshooters Ridge to Arrowhead Ridge and Windmill Hill**

Under Alternative C, a new interpretive foot trail would be constructed from New Mexico Highway 50 below Sharpshooters Ridge up to Arrowhead Ridge and on to Windmill Hill. This new trail would be approximately 2.25 miles in length, and would be a natural, non-paved trail. Appropriate signage would be posted along the trail to minimize social trailing and add to the interpretive needs. Alternative C was dismissed due to parking and safety considerations along the Highway 50 corridor.

### **Alternative D - Construct Interpretive Foot Trail from Sleepy Eye to Sharpshooter's Ridge**

Under Alternative D, a new interpretive foot trail would be constructed from park-owned "Sleepy Eye" building to Sharpshooter's Ridge. This new loop trail would be approximately 1.5 miles in length, and would be a natural, non-paved trail. Appropriate signage would be posted along the trail to minimize social trailing and add to the interpretive needs. Alternative D was dismissed due to parking and safety considerations along the Highway 50 corridor.

## Mitigation Measures

The following mitigation measures have been developed to minimize the degree and/or severity of adverse effects, and would be adhered to during implementation of the preferred alternative:

- Construction activities would be scheduled to minimize construction-related impacts upon visitors. Areas not under construction would remain accessible to visitors as much as is safely possible.
- Trail crews would be required to appoint a foreman to oversee trail maintenance activities. The National Park Service would coordinate with foremen and any volunteers to monitor trail construction as per National Park Service standards. Specifically, NPS will monitor and or direct water bar placement, drainage placement, brushing and clearing, re-vegetation, where to obtain fill and other materials for trails, and how to apply fill materials such as soil, gravel, rocks, etc. Trail foremen would be responsible for ensuring that their crew performs the necessary work in accordance with instructions and standards provided by the National Park Service.
- A construction zone for installation of trail, as well as staging areas and work zones would be identified and demarcated with construction tape or some similar material prior to any construction activities. The tape would define the zone and confine the activity to the minimum area needed for implementing the project. All protection measures would be clearly stated in the construction specifications and workers would be instructed to avoid conducting activities beyond the zone as defined by the fencing. In addition, the National Park Service would ensure that all workers are informed that damage to resources outside the scope of work is subject to prosecution, fine, restitution costs, and other penalties.
- To minimize the amount of ground disturbance, staging and stockpiling areas would be located in previously disturbed sites, away from visitor use areas to the extent possible. All staging and

stockpiling areas would be returned to pre-construction conditions following construction. Existing vegetation at the site would not be disturbed to the extent possible.

- To minimize the amount of disturbance to sensitive resources, an education program would be established to inform the public of the need to protect these resources. This program will likely entail posting information at the Visitor Center and trailhead.
- Should construction unearth previously undiscovered cultural resources, work would be stopped in the area of any discovery and the park would consult with the state historic preservation officer and the Advisory Council on Historic Preservation, as necessary, according to §36 CFR 800.13, *Post Review Discoveries*. In the event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) would be followed.
- The National Park Service would ensure that all workers are informed of the penalties for illegally collecting resources or intentionally damaging resources. Construction workers and supervisors would be informed about the special sensitivity of the Park’s values and regulations.

**Alternative Summaries**

Table 1 summarizes the major components of Alternatives A and B, and compares the ability of these alternatives to meet the project objectives (the objectives for this project are identified in the *Purpose and Need* chapter). As shown in the following table, Alternative B meets each of the objectives identified for this project, while the no action alternative does not meet these objectives.

**Table 1 – Summary of Alternatives and Extent to Which Each Alternative Meets Project Objectives**

<b>Alternative Elements</b>	<b>Alternative A – No Action</b>	<b>Alternative B – Construction</b>
Construct Interpretive Foot Trail from the Old Denver Highway to Arrowhead Ridge and Windmill Hill	No trail would be constructed.	A new interpretive trail would be constructed from the Old Denver Highway to Arrowhead Ridge and Windmill Hill. Signage and interpretive media would be added.
Construct Trailhead Parking	Trailhead parking would not be constructed	Trailhead parking would be constructed including: signage, interpretive media, a trash receptacle, and toilets.
Improve Trailhead Access Road	The trailhead access road would not be improved	The trailhead access road would be improved on NPS or NPS/County lands using new or recycled asphalt.
<b>Project Objectives</b>	<b>Meets Project Objectives?</b>	<b>Meets Project Objectives?</b>
Open the Battlefield to Safe Public Access.	No. With no new trail, the battlefield will not be open to safe public access	Yes. With a new trail, the battlefield will be open to safe public access
Provide expanded on-site interpretation of the Battle of Glorieta Pass	No. With no new trail, expanded on-site interpretation of the Battle of Glorieta Pass is not provided	Yes. With a new trail, expanded on-site interpretation of the Battle of Glorieta Pass is provided
Increase visitor opportunities and improve visitor enjoyment	No. With no new trail, there are not increased visitor opportunities.	Yes. With a new trail, visitor opportunities increase.
Minimize impacts and prevent impairment to park resources & values.	No. Social trails would be created causing impacts to soils, vegetation, and visual resources.	Yes. A new designated trail would minimize social trailing and its associated impacts to the environment.



Table 2 summarizes the anticipated environmental impacts for Alternatives A and B. Only those impact topics that have been carried forward for further analysis are included in this table. The *Environmental Consequences* chapter provides a more detailed explanation of these impacts.

**Table 2 – Environmental Impact Summary by Alternative**

Impact Topic	Alternative A – No Action	Alternative B – Construction
<b>Soils</b>	Without construction activities, the impact to soils would be beneficial and long-term because no ground disturbance would occur; however, social trails could develop, causing increased soil erosion, loss, and compaction to a minor to moderate degree.	Construction of the new trail would result in the disturbance and loss of soils, having an overall minor effect to soils. Long-term use of the trail would further loosen and erode soils within the footprint of the new trail; however, social trails under this alternative would be prevented, thereby having a beneficial, long-term, impact to soils.
<b>Vegetation</b>	Without construction activities, the impact to vegetation would be beneficial and long-term because no ground disturbance would occur; however, social trails could develop, causing increased vegetation disturbance and introduction of exotics to a negligible to minor degree.	Construction of the new trail would result in the disturbance and loss of vegetation, and the potential for exotics to be introduced. This would have an overall minor effect to vegetation. Long-term use of the trail could further damage vegetation, particularly if users step off the trail; however, possible social trails under this alternative would be prevented and/or rehabilitated, thereby having a beneficial, long-term, impact to vegetation.
<b>Visitor Use and Experience</b>	With no construction, this alternative would have no effect to the current visitor experience.	Construction would have short-term, minor, adverse effects to visitors from noise, dust, and disruption of solitude. Beneficial effects of this alternative include increased visitor opportunities from constructing a new trail. Trailhead, and access road and by installing directional and interpretive signage.
<b>Park Operations</b>	There would be no change in current park operations. Park staff would continue to maintain and patrol the area based on priority and funding.	Implementation of this alternative will increase the workload of Park staff to a minor to moderate degree due to maintenance, monitoring, and patrolling of the new trail.

## Identification of the Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying the criteria suggested in the National Environmental Policy Act of 1969 (NEPA), which guides the Council on Environmental Quality (CEQ). The CEQ provides direction that “the environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA’s Section 101:

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

3. Attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
4. Preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
5. Achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life's amenities; and
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Alternative A, No Action, only minimally meets the above six evaluation factors because it does not promote minimizing impacts to Park resources that will likely result from social trailing in the area. Therefore, Alternative A does not meet the objectives to provide safe and esthetically pleasing surroundings (criteria 2) without environmental degradation (criteria 3).

Alternative B is the environmentally preferred alternative because it best addresses these six evaluation factors. Alternative B better meets these objectives than Alternative A primarily because this alternative would create a new trail, thereby minimizing future social trail development. By doing so, damage to vegetation, soils, and the visual setting would be avoided (criteria 3). This alternative also balances resource and visitor use (criteria 5), and with proper signage and maintenance, provides safe and esthetically pleasing surroundings (criteria 2). Therefore, Alternative B better meets the objectives to minimize resource damage and provide a wide range of beneficial uses without environmental degradation for succeeding generations.

No new information came forward from public scoping or consultation with other agencies to necessitate the development of any new alternatives, other than those described and evaluated in this document. Because it meets the purpose and need for the project, the project objectives, and is the environmentally preferred alternative, Alternative B is recommended as the National Park Service Preferred Alternative. For the remainder of the document, Alternative B will be referred to as the Preferred Alternative.

## ENVIRONMENTAL CONSEQUENCES

This chapter analyzes the potential environmental consequences, or impacts, that would occur as a result of implementing the proposed project. Topics analyzed in this chapter include soils, vegetation, visitor use and experience, and park operations. All remaining impact topics were dismissed as discussed in Chapter 1 *Purpose and Need*. Also contained in Chapter 1 are descriptions of the affected environment for the resource topics included in this chapter. Direct, indirect, and cumulative effects, as well as impairment are analyzed for each resource topic carried forward. Potential impacts are described in terms of type, context, duration, and intensity. General definitions are defined as follows, while more specific impact thresholds are given for each resource at the beginning of each resource section.

- **Type** describes the classification of the impact as either beneficial or adverse, direct or indirect:
  - Beneficial**: A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition.
  - Adverse**: A change that moves the resource away from a desired condition or detracts from its appearance or condition.
  - Direct**: An effect that is caused by an action and occurs in 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 is still reasonably foreseeable.



- **Context** describes the area or location in which the impact would occur. Are the effects site-specific, local, regional, or even broader?
- **Duration** describes the length of time an effect would occur, either short-term or long-term:
  - Short-term impacts generally last only during construction, and the resources resume their pre-construction conditions following construction.
  - Long-term impacts last beyond the construction period, and the resources may not resume their pre-construction conditions for a longer period of time following construction.
- **Intensity** describes the degree, level, or strength of an impact. For this analysis, intensity has been categorized into negligible, minor, moderate, and major. Because definitions of intensity vary by resource topic, intensity definitions are provided separately for each impact topic analyzed in this Environmental Assessment.

**Cumulative Effects:** The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act of 1969 (42 USC 4321 et seq.), 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 non-federal) or person undertakes such other actions" (40 CFR 1508.7). Cumulative impacts are considered for both the No Action and Preferred Alternatives.

Cumulative impacts were determined by combining the impacts of the preferred alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at Pecos National Historical Park and, if applicable, the surrounding region. The geographic scope for this analysis includes elements within Park's boundaries, as well as actions outside the Park within Santa Fe County and on adjacent lands. Most of the cumulative effects are related to the rapid urbanization facing Pecos National Historical Park and the Pecos Valley. The geographic area of consideration for cumulative impacts varies slightly by impact topic. Following are some of the actions and trends that were considered particularly important for the purpose of conducting the cumulative effects analysis.

- Continued growth in the construction of housing, commercial development, and other infrastructure in Santa Fe County.
- Transportation planning, including proposals for road improvements and alternative transportation.
- Increasing visitation and pressures to fulfill local recreation demand.
- Proliferation of nonnative invasive plants, especially tamarisk.
- Natural geologic processes, including erosion, flash floods, and landslides.
- Active land-use planning and cooperation by all levels of government.
- Social trailing in the Park.

**Impairment:** *National Park Service's Management Policies 2006* require analysis of potential effects to determine whether or not actions would impair park resources (NPS 2006). 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 to minimize to the greatest degree practicable, adversely

impacting park resources and values. However, the laws do give the National Park Service the management discretion to allow impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park, as long as the impact does not constitute impairment of the affected resources and values.

Although Congress has given the National Park Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement that the National Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values. An impact to any park resource or value may constitute an impairment, but an impact would be more likely to constitute an impairment to the extent that it has a major or severe adverse effect upon a resource or value whose conservation is 1) necessary to fulfill specific purposes identified in the enabling legislation or proclamation of the park; 2) key to the natural or cultural integrity of the park; or 3) identified as a goal in the park's general management plan or other relevant National Park Service planning documents.

Impairment may result from National Park Service activities in managing the park, visitor activities, or activities undertaken by concessionaires, contractors, and others operating in the park. A determination on impairment is made in the Conclusion section for each of the resource related topics carried forward in this chapter.

## Soils

### Intensity Level Definitions

Analysis of the potential impacts to soils was derived from the available soils information and the Park staff's past observations of the effects on soils from both visitor use and construction activities. The thresholds for this impact assessment are as follows:

- Negligible:** The impact is at the lowest levels of detection and causes very little or no physical disturbance /removal, compaction, unnatural erosion, when compared with current conditions.
- Minor:** The impact is slight but detectable in some areas, with few perceptible effects of physical disturbance/removal, compaction, or unnatural erosion of soils.
- Moderate:** The impact is readily apparent in some areas and has measurable effects of physical disturbance/removal, compaction, or unnatural erosion of soils.
- Major:** The impact is readily apparent in several areas and has severe effects of physical disturbance/removal, compaction, or unnatural erosion of soils.
- Impairment:** A major, adverse impact to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the enabling legislation or proclamation of Pecos National Historical Park; (2) key to the natural or cultural integrity of the National Park; or (3) identified as a goal in the National Park's general management plan or other relevant National Park Service planning documents.

### Impacts of Alternative A – No Action

Under this alternative, there would be no construction of a new trail. Without construction activities, soils would not be impacted because no ground disturbance would occur.

Soils may be disturbed through the possible development of social trails in the area. Use of social trails would result in erosion and trampling of soils in this general area. This would be a long-term, minor to

moderate, adverse effect to soils as they erode and are carried to lower elevations by wind, storm events, and continue trail use.

Cumulative Impacts: Continued growth in Santa Fe County, particularly construction development, combined with increasing visitation and social trailing in the project area has contributed to the overall disturbance and loss of soils in the greater area. Natural geologic processes including flash flooding increases this soil loss, particularly when the soils have been loosened or disturbed by previous activity or construction. When combined with other past, present, and foreseeable future actions that would result in impacts to soils, this alternative would contribute a negligible amount of soil loss to the geographic area of this analysis.

Conclusion: Without construction activities, the impact to soils would be beneficial and long-term because no ground disturbance would occur; however, social trails could develop, causing increased soil erosion, loss, and compaction to a minor to moderate degree. Cumulatively, this alternative would contribute negligible amount of soil loss when combined with other ground disturbing activities in the greater area including development in Santa Fe County, increased visitation to the Park, and social trailing. Because the impacts would be less than major, there would be no impairment to soils.

## **Alternative B – Construct Interpretive Foot Trail from the Old Denver Highway to Arrowhead Ridge and Windmill Hill**

Any construction activities under this alternative including the new trail, trailhead parking, access road improvement and installing signage and interpretive media would result in ground disturbance, thereby impacting soils. Construction activities may compact soils in some areas and/or loosen soils in other areas. Construction limits would help minimize the amount of soil disturbance resulting in an overall long-term, minor adverse effect to soils.

Long-term use of the new trail would continue to loosen and erode soils within the trail prism. Some sections of trail would continue to experience greater degrees of impacts depending on soil composition, slope, trail design, climate, and existing trail conditions. In areas of unstable soils and steeper grades, soils would be carried to lower elevations by wind, storm events, and continued trail use. Impacts on soils in these sections of trail are adverse, long-term and of minor intensity.

Routine NPS trail repair and maintenance would occur as funding and prioritized needs allowed and long-term soil loss could be avoided through proper trail repair and maintenance.

Cumulative Impacts: Cumulative impacts to soils under this alternative would be similar to those described under Alternative A. When combined with other past, present, and foreseeable future actions that would result in impacts to soils, particularly construction in the greater Santa Fe County area, this alternative would contribute a negligible amount of soil loss to the geographic area of this analysis.

Conclusion: Construction under Alternative B would result in the disturbance and loss of soils, having an overall minor adverse effect to soils. Long-term use of the trail would further loosen and erode soils within the footprint of the new trail. Cumulatively, this alternative would contribute negligible amount of soil loss when combined with other ground disturbing activities in the greater area including development in Santa Fe County, increased visitation to the Park, and potential social trailing. Because impacts are less than major, there would be no impairment to soils.

## **Vegetation**

### **Intensity Level Definitions**

All available information on known vegetation in the Park was compiled, and site-specific information was identified. Where possible, information from field studies of vegetation and observations of exotic species

was also used. Predictions about short- and long-term site impacts were based on previous studies of visitor impacts to vegetation and previous monitoring data from the area.

- Negligible:** An action that could result in a change to a population or individuals of a species or a resource, but the change would be so small that it would not be of any measurable or perceptible consequence.
- Minor:** An action that could result in a change to a population or individuals of a species or a resource. The change would be small and localized and of little consequence.
- Moderate:** An action that would result in some change to a population or individuals of a species or resource. The change would be measurable and of consequence to the species or resource but more localized.
- Major:** An action that would have a noticeable change to a population or individuals of a species or resource. The change would be measurable and result in a severely adverse or major beneficial impact, and possible permanent consequence, upon the species or resource.
- Impairment:** A major, adverse impact to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the enabling legislation or proclamation of Pecos National Historical Park; (2) key to the natural or cultural integrity of the National Park; or (3) identified as a goal in the National Park's general management plan or other relevant National Park Service planning documents.

### **Impacts of Alternative A – No Action**

Under this alternative, there would be no construction of a new trail or trailhead parking area or improvement to the access road. Without construction activities, vegetation would not be impacted because no ground disturbance would occur.

Cumulative Impacts: Vegetation has been and will continue to be lost to rapid urbanization in Santa Fe County. Increased urbanization also brings with it the emergence of exotic vegetation on public lands. Recreational use on trails and other areas within the Park continue to have adverse, incremental impacts to vegetation as well. Impacts associated with not constructing a new trail is expected to contribute to a negligible amount of vegetation loss when considered with other past, present, and reasonably foreseeable future actions in the greater area.

Conclusion: Without construction activities, the impact to vegetation would be beneficial and long-term because no ground disturbance would occur. Cumulatively, this alternative would contribute negligible amount of vegetation loss and disturbance when combined with other ground disturbing activities in the greater area including development in Santa Fe County, increased visitation to the Park, and potential social trailing. Because the impacts would be less than major, there would be no impairment to vegetation.

### **Alternative B – Construct Interpretive Foot Trail from the Old Denver Highway to Arrowhead Ridge and Windmill Hill**

Any construction activities under this alternative including the new trail, trailhead parking area or access road improvement would result in ground disturbance. Construction activities may remove or trample vegetation in a localized area. Construction limits would help minimize the amount of vegetation disturbance resulting in an overall long-term, minor adverse effect to vegetation.

Some vegetation would continue to be lost as a result of ongoing trail use. Hikers may move aside or yield to another trail user, inadvertently trampling vegetation and/or loosening the soil. Impacts would be adverse, long-term and of negligible to minor intensity. Vegetation may also be indirectly impacted by soil

erosion. As more soils are disturbed within and outside of the trail prism, erosion from storm events may harm smaller shrubs and trees by removing stabilizing soils and exposing roots. Trail crews would maintain the trail by stabilizing soils and planting native species in key locations.

Exotic species could be inadvertently transported in and spread along the trail through hikers. The level of impact would depend on the amount of use the trail receives and on how much imported seed successfully establishes along the trail. Following construction of the new trail, areas that were disturbed will be monitored and exotic vegetation will be removed. Given this mitigation measure, vegetation impacts would be adverse, and of negligible to minor intensity.

**Cumulative Impacts:** Cumulative impacts to vegetation under this alternative would be similar to those described under Alternative A. Impacts associated with constructing a new trail and trailhead is expected to contribute to a negligible amount of vegetation loss when considered with other past, present, and reasonably foreseeable future actions in the greater area.

**Conclusion:** Construction under Alternative B would result in the disturbance and loss of vegetation, and the potential for exotics to be introduced. This would have an overall minor adverse effect to vegetation. Long-term use of the trail would further damage vegetation, particularly when users step off the trail contributing to long-term minor impact to vegetation. Cumulatively, this alternative would contribute negligible amount of vegetation loss when combined with other ground disturbing activities in the greater area including development in Santa Fe County, increased visitation to the Park, and potential social trailing. Because impacts are less than major, there would be no impairment to vegetation.

## Visitor Use and Experience

### Intensity Level Definitions

The methodology used for assessing impacts to visitor use and experience is based on how construction of a new trail would affect the visitor, including safety considerations and maintaining the resource for future generations to enjoy. Trail monitoring data and personal observation records of visitation patterns by Park staff were used to estimate the effects of the alternative actions on visitors. The impact on the ability of the visitor to experience a full range of park resources was analyzed by examining resources mentioned in the park significance statement. The thresholds for this impact assessment are as follows:

- Negligible:** Visitors would not be affected or changes in visitor use and/or experience would be below or at the level of detection. Any effects would be short-term. 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 and likely short-term. The visitor would be aware of the effects associated with the alternative, but the effects would be slight.
- Moderate:** Changes in visitor use and/or experience would be readily apparent and likely long-term. The visitor would be aware of the effects associated with the alternative, and would likely be able to express an opinion about the changes.
- Major:** Changes in visitor use and/or experience would be readily apparent and have substantial long-term consequences. The visitor would be aware of the effects associated with the alternative, and would likely express a strong opinion about the changes.

### Impacts of Alternative A – No Action

Under this alternative, there would be no new trail or trailhead parking area constructed. Without any construction activities, there would be no construction-related impacts such as noise and dust, and the

visitor experience would remain the same. Existing uses on the trails within the Park would remain the same.

Users would not access the area. The long-term effect to the visitor use and experience would therefore be minor and adverse.

Cumulative Impacts: As the population in the Pecos Valley area increases, demand for accessible recreation areas will also increase, bringing with it a greater potential for crowding and visitor use conflicts on Park trails. With increasing visitation, social trails would be expected to develop in use and number. The cumulative impact on users would vary depending on the growth/expansion of area trails and access points and the quality of these trails. Given the current number and length of accessible trails in the Park and within Santa Fe County, the incremental impact of not constructing the trail under this alternative would have negligible impacts on all recreation users.

Conclusion: With no construction, this alternative would have no effect to the visitor experience; however, in the long-term, visitors could begin developing and/or using a network of social trails which may lead to impacts to visitor safety, the visual setting, and visitor enjoyment. These adverse impacts are expected to be long-term and minor in degree. With the growing number of trails and trail use in the Park and within Santa Fe County, the incremental impact of not constructing the trail under this alternative would have negligible impacts on all visitors.

## **Alternative B – Construct Interpretive Foot Trail from the Old Denver Highway to Arrowhead Ridge and Windmill Hill**

Construction of a new trail under this alternative would increase visitor opportunities and improve visitor enjoyment by establishing a permanent interpretive foot trail and trailhead from the Old Denver Highway to Arrowhead Ridge and Windmill Hill. These improvements would have long-term moderate beneficial effects to visitors in this area of the Park.

Existing uses on trails in the Park would not change. Hiking use would be permitted, while other uses would be prohibited. Consistent with regulations in other sections in the park, dogs will be permitted on a leash. Visitors wanting to bike would not be permitted to use the newly constructed trail.

Construction activities would increase noise and disrupt the solitude of the area for the short-term, until construction activities cease. Mitigation measures will be applied to reduce this level of disruption including the use of non-mechanized (less noise) tools and fencing off construction zones to make the area safer to visitors. With the mitigation measures, construction activities are expected to have short-term, minor, adverse effects to visitors in the localized area.

This alternative would enhance visitor safety. Signage and interpretive media would be erected in appropriate locations to guide the visitor to certain destinations, thereby lessening potential visitor confusion and frustration. These beneficial effects to visitor use and experience are long-term and minor degree.

Cumulative Impacts: The overall cumulative effect to visitor use and experience is the same as described under Alternative A. Given the continued growth and use of trails in the Park and within Santa Fe County, the incremental impact of constructing the trail under this alternative would have negligible impacts on all recreation users.

Conclusion: Construction of the new trail and trailhead parking area and improvement to the access road would have short-term, minor, adverse effects to visitors from noise, dust, and disruption of solitude. Beneficial effects of this alternative include increased visitor opportunities from constructing a new trail, and enhanced visitor experience from installing directional signage and interpretive media. Cumulatively, this alternative would contribute negligibly to visitor use and experience given the growing number of recreational trails and users in the Pecos Valley area.



## Park Operations

### Intensity Level Definitions

Implementation of a project can effect the operations of a park such as the number of employees needed; the type of duties that need to be conducted; when/who would conduct these duties; how activities should be conducted; and administrative procedures. Park operations, for the purpose of this analysis, refer to the current staff available to adequately protect and preserve vital park resources and provide for an effective visitor experience. The discussion of impacts to park operations focuses on (1) law enforcement and any other staff available to ensure visitor and employee safety on the trails, and (2) the ability of the trail/maintenance crew to protect and preserve resources given current funding and staffing levels. Park staff knowledge was used to evaluate the impacts of each alternative and is based on the current description of park operations presented in the Purpose and Need section of this document. The methodology used to assess potential changes to park operations is defined as follows:

- Negligible:** Park operations would not be affected or the effect would be at or below the lower levels of detection, and would not have an appreciable effect on park operations.
- Minor:** The effect would be detectable, but would be of a magnitude that would not have an appreciable adverse or beneficial effect on park operations. If mitigation were needed to offset adverse effects, it would be relatively simple and successful.
- Moderate:** The effects would be readily apparent and would result in a substantial adverse or beneficial change in park operations in a manner noticeable to staff and the public. Mitigation measures would probably be necessary to offset adverse effects and would likely be successful.
- Major:** The effects would be readily apparent and would result in a substantial adverse or beneficial change in park operations in a manner noticeable to staff and the public, and be markedly different from existing operations. Mitigation measures to offset adverse effects would be needed, could be expensive, and their success could not be guaranteed.

### Impacts of Alternative A – No Action

Under this alternative, there would be no change to park operations. Park staff would continue to patrol the project area as funding and staffing levels permit. Park trails would continue to be assessed and ranked in order of priority, and trail/maintenance crews would repair and maintain trails in accordance with the prioritized schedule. Given the amount of resource damage that is anticipated to the area should no trail be built, the impact on park operations staff time resulting from the attention to this area would continue to be negligible. Given the limited existing and projected staffing levels, park rangers would continue to patrol the area on a very limited basis.

Cumulative Impacts: Park trail/maintenance crews oversee the repair and maintenance of the trails in the park. Given the limited length of the current trail system and the amount of resource damage present on trails in the park, this alternative would have negligible impacts on park operations workload.

Conclusion: There would be no change in current park operations. Park staff would continue to patrol the area based on priority and funding. Cumulatively, this alternative would have negligible impacts on park operations workload because Park staff currently patrol the area infrequently and no trail currently exists in this area.

## **Alternative B – Construct Interpretive Foot Trail from the Old Denver Highway to Arrowhead Ridge and Windmill Hill**

Under this alternative, Park staff would oversee the construction of the new trail and trailhead. The majority of actual construction work is expected to be performed by contractors; however, park staff will still be needed to oversee the design and construction. This will add to the workload of staff involved in the project to a minor to moderate degree, and will cease following construction activities.

Staff would also be required to maintain and perform safety patrols of the new trail and trailhead which will increase staff workload.

Park operations, including daily activities such as trail and facility maintenance, visitor services, and law enforcement patrols may be affected by this proposed trail. The Park maintenance and visitor protection staffs are currently charged with maintaining and patrolling 1.5 miles of trails. This proposal would add an additional 150% to the (trail) work load with no additional funds or staff projected. The 150% increased (trail) workload is an estimate and could increase dependent upon the number, type and timing of users.

Cumulative Impacts: The overall cumulative effect to park operations is the same as described under Alternative A. Given the length of the trail system and the amount of resource damage present on current park trails, this alternative would have minor to moderate impacts on the overall park operations workload.

Conclusion: Implementation of this alternative may increase the workload of Park staff to a minor to moderate degree due to maintenance, monitoring, and patrolling of the new trail. This alternative is expected to contribute minor to moderately to the overall cumulative effect to park operations.

# **CONSULTATION AND COORDINATION**

## **Internal Scoping**

Internal scoping was conducted by an interdisciplinary team of professionals from Pecos National Historical Park. Interdisciplinary team members met on February 13, 2007 to discuss the purpose and need for the project; various alternatives; potential environmental impacts; past, present, and reasonably foreseeable projects that may have cumulative effects; and possible mitigation measures. The team also gathered background information and discussed public outreach for the project. Over the course of the project, team members have conducted individual site visits to view and evaluate the proposed trail location. The results of the February 13, 2007 meeting are documented in this Environmental Assessment.

## **External Scoping**

External scoping was initiated with the distribution of a scoping letter to inform the public of the proposal to construct an interpretive foot trail from the Old Denver Highway to Arrowhead Ridge and Windmill Hill, and to generate input on the preparation of this Environmental Assessment. The scoping letter dated March 2, 2007 was mailed to over 75 Park neighbors in the Pecos, New Mexico area. Another letter March 2, 2007 was distributed to potentially interested Native American tribes. In addition, the scoping letter was sent to the New Mexico State Historic Preservation Officer, U.S. Fish and Wildlife Service, and the New Mexico Department of Game and Fish. Scoping information was also sent to local media as a Press Release and posted on the National Park Service Planning, Environment, and Public Comment website (<http://parkplanning.nps.gov/>).

During the 30-day scoping period, six responses were received. The majority of comments were in support of the project. A few concerns were raised regarding: scenic value of the trailhead and parking

area; location of the parking area and access road to private property; location of trail overlooks to private homes and possible view/sound-shed issues; and potential human/wildlife interactions. No other comments were received during scoping.

All public comments were incorporated into the development of this Environmental Assessment. Various trailhead parking placement options were considered and addressed under all alternatives and the location of the trail, trailhead parking area and parking area access road was confined solely to National Park Service lands and Santa Fe County roadways. Trail overlooks have been chosen to maximize views of the battlefield while maintaining as much as possible the privacy of land owners in the valley below. Wildlife issues were also examined and addressed under wildlife and special status species.

## List of Recipients and Public Review

The Environmental Assessment will be released for public review in May 2007. To inform the public of the availability of the Environmental Assessment, the National Park Service will publish and distribute a letter and press release to various agencies, and members of the public on the Park's mailing list. Copies of the Environmental Assessment will be provided to interested individuals, upon request. Copies of the document will also be available for review at the Park's visitor center and on the internet at the National Park Service Planning, Environment, and Public Comment website (<http://parkplanning.nps.gov/>).

The Environmental Assessment is subject to a 30-day public comment period. During this time, the public is encouraged to submit their written comments to the National Park Service. Following the close of the comment period, all public comments will be reviewed and analyzed, prior to the release of a decision document. The National Park Service will issue responses to substantive comments received during the public comment period, and will make appropriate changes to the Environmental Assessment, as needed.

## List of Preparers

### Preparers (developed EA content):

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### Consultants (provided information/expertise):

- Kristine Johnson, Director, Natural Heritage New Mexico, Research Associate Professor, Biology Department, University of New Mexico, Albuquerque New Mexico

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