GENERAL MANAGEMENT PLANNING ISSUES AND CONCERNS

INTRODUCTION

General management planning involves the development of multiple alternatives that represent different visions for the future management of Guadalupe Mountains National Park. The alternatives are then evaluated for their effects on natural, cultural, and social resources. A record of decision is used to identify the preferred alternative for directing the future management of the park.

The National Park Service views public involvement as a critical component in the success of the alternatives development process and general management planning as a whole. As demonstrated in table 2, the National Park Service provides public involvement opportunities from project initiation through final document publication.

"Public " refers to any individuals or organizations who perceive themselves as caring about or being affected by management decisions for Guadalupe Mountains National Park. This includes, but is not limited to, local residents; area landowners; NPS staff; other governmental agencies at the local, state, or federal level; tribes; park visitors; local, state, and national special interest organizations; and citizens who consider themselves stewards of the special places saved by the American people so that all may experience our heritage.

An issue is an opportunity, conflict, or problem regarding the use or management of public lands. Issues and concerns relating to general management planning at Guadalupe Mountains National Park were identified by the public, as defined above, during scoping. As described in "Chapter 5: Consultation and Coordination," comments were solicited using such tools as public meetings, planning newsletters, and the Internet.

Comments received during scoping demonstrated that there is considerable public satisfaction with the current management of Guadalupe Mountains National Park. Specifically, members of the public are generally pleased with the park's facilities and the range and level of public use.

As discussed in Chapter 2 under the heading "Alternatives or Actions Considered but Dismissed from Detailed Evaluation," some public concerns were not incorporated into general management planning. These suggestions

- were not feasible
- would conflict with laws, regulations, or NPS policy
- are typically addressed in more detailed plans, such as 5-year strategic plans, annual performance plans, and implementation plans

The issues and concerns that the general management plan can address generally involve determining appropriate visitor uses, types of facilities, and levels of services while remaining compatible with desired resource conditions-and existing law, regulations, and policies. The plans identified above tier from the general management plan and are used to turn the general management plan's vision into reality.

PARK-WIDE ISSUES AND CONCERNS

Park-wide issues and concerns are expressed here as questions about the future of the park. They are a compilation of responses received from the public during the initial steps of the general management planning process.

Table 2: The National Park Service Has Provided Opportunities for Public Involvement throughout the General Management Planning Process for Guadalupe Mountains National Park

PLANNING ACTIVITY	PUBLIC INVOLVEMENT OPPORTUNITIES
Initiate Project The planning team assembles and begins to identify the project's scope and issues and customize the process to fit Guadalupe Mountains National Park.	Newsletters inform the public about the planning process and solicit feedback. The public can comment on response forms or via the Internet and ask to be included on the park's mailing list.
Initiate Planning Context The team examines WHY Congress established the park and reaffirms the park's mission, purpose, and significance. Team members collect public comments during scoping and analyze relevant technical data.	Public open houses help the public learn about the planning process and add public input.
Develop and Evaluate Alternatives The planning team explores WHAT the park's future could look like, and proposes and assesses a range of reasonable alternatives for the park's future.	Newsletters inform the public about the planning process and solicit feedback. The public can comment on response forms or via the Internet and ask to be included on the park's mailing list.
Prepare a Draft Document The team produces and publishes a *Draft General Management Plan / Environmental Impact Statement* that discusses HOW each alternative concept would be attained; what the impacts of those actions would be on natural, cultural, and socioeconomic resources; and what costs would be incurred. The draft document describes the planning context, management alternatives, and their impacts. Based on the impacts of implementing the alternatives and public comment, the team defines the NPS' preferred alternative.	The draft plan brings the planning process and alternatives into focus. The public can read the plan and comment by letter or via the Internet on the alternatives and impacts presented. In addition, public meetings are held to inform the public of the plan's contents and the findings of the environmental impact statement, and to obtain public comments.
Prepare and Publish a Final Document Based on public comments on the draft document, the team revises the *Draft General Management Plan / Environmental Impact Statement* and distributes a final plan to the public.	The final plan is available to the public. It includes the NPS responses to substantive comments, plus all changes made to the plan in response to comments.

Resource Management

- What park boundaries would contribute to effective resource preservation?
- What general standards should be established for wildlife and plant community management? Examples include resource protection, resource control, restoration, exotic species control, and possible reintroduction of native species.
- What is the best way to interpret the stratotype sections and provide for research needs while preserving this international benchmark?
- What is the best way to preserve the park's paleontological resources while providing for access trails and other facilities that transverse these resources?
- What management tools could be used to reduce the impacts of visitor use and outside-the-park actions on the park's physical, biotic, and cultural resources?
- How can the National Park Service best meet the desired conditions for wilderness, taking into consideration visitor satisfaction needs, safety, and fundamental resource values?
- How would the museum collections and archives be best managed and preserved?
- What is the best treatment for remnant historic ranching equipment and structures?
- What would be the best use or preservation treatment for historic buildings and landscapes?
- How can the National Park Service gain an understanding of traditional cultural uses of and ethnographic significance to American Indians, and how should these resources best be recognized and managed?
- How do urban growth, changing demographics, and adjacent land uses affect park resources and operations?
- What is the role of wildland fire in maintaining natural ecosystems?

Visitor Use and Understanding

- Should improvements be made in park orientation and facility support for visitors?
- What are the opportunities to enhance the public's interpretation, experiences, and understanding?
- What is the best use of the space in the visitor center?
- How can the National Park Service provide visitors with consistently available interpretation of wilderness and cultural history?
- What is the appropriate level of outreach to regional communities and schools?
- What part of the park should be managed as backcountry?
- Does public access to the park need to be improved or increased?
- What are appropriate uses of the various landscape units of the park?
- Do visitors with impaired mobility have adequate and appropriate access?
- What are appropriate management and use of sensitive resource areas?
- Are there enough hiking and camping facilities and opportunities?
- Should horseback riding regulations be reevaluated?
- Are there appropriate scenic driving opportunities? What is the proper level of motor vehicle use in the park?
- How are wildlife viewing opportunities best perpetuated? This is an important issue for many visitors because most land in Texas is privately owned and opportunities for viewing wildlife are limited.
- How can the National Park Service best ensure continued access to Guadalupe Canyon and protect the viewshed in the Guadalupe Pass area?

Facilities and Operations

- What level of park development is appropriate? To what extent should the park provide visitor facilities such as campgrounds, restrooms, water, picnic tables, and shade structures?

- Which locations for the above facilities are appropriate, considering visibility, viewsheds, safety, and resource impacts?
- Is there a need for commercial services?
- What level of minimum improvement is necessary in wilderness to protect character and provide for resource protection and visitor satisfaction?
- What is the appropriate level of parking to accommodate current and future use at destination areas and trailheads such as McKittrick Canyon, Frijole Ranch, Williams Ranch, Pine Springs trailhead, Ship on the Desert, and Salt Basin Dunes?
- What is the appropriate level of trail access to accommodate a wide range of visitor needs?
- What are the best engineering and design measures for park trails to maximize sustainability, reduce maintenance cycles, provide visitor safety, and reduce impairment on park resources?
- There is inadequate office space to meet park needs. How can office space requirements be met without impacting visitors and or housing needs?
- What is the appropriate location and size of a park headquarters and office that would improve organizational effectiveness?

SITE-SPECIFIC ISSUES

The Landscape Units map identifies the major landscape components of Guadalupe Mountains National Park. Brief descriptions of the key features within each landscape unit, and the management issues that could be addressed by general management planning alternatives are provided below.

Pine Spring Canyon

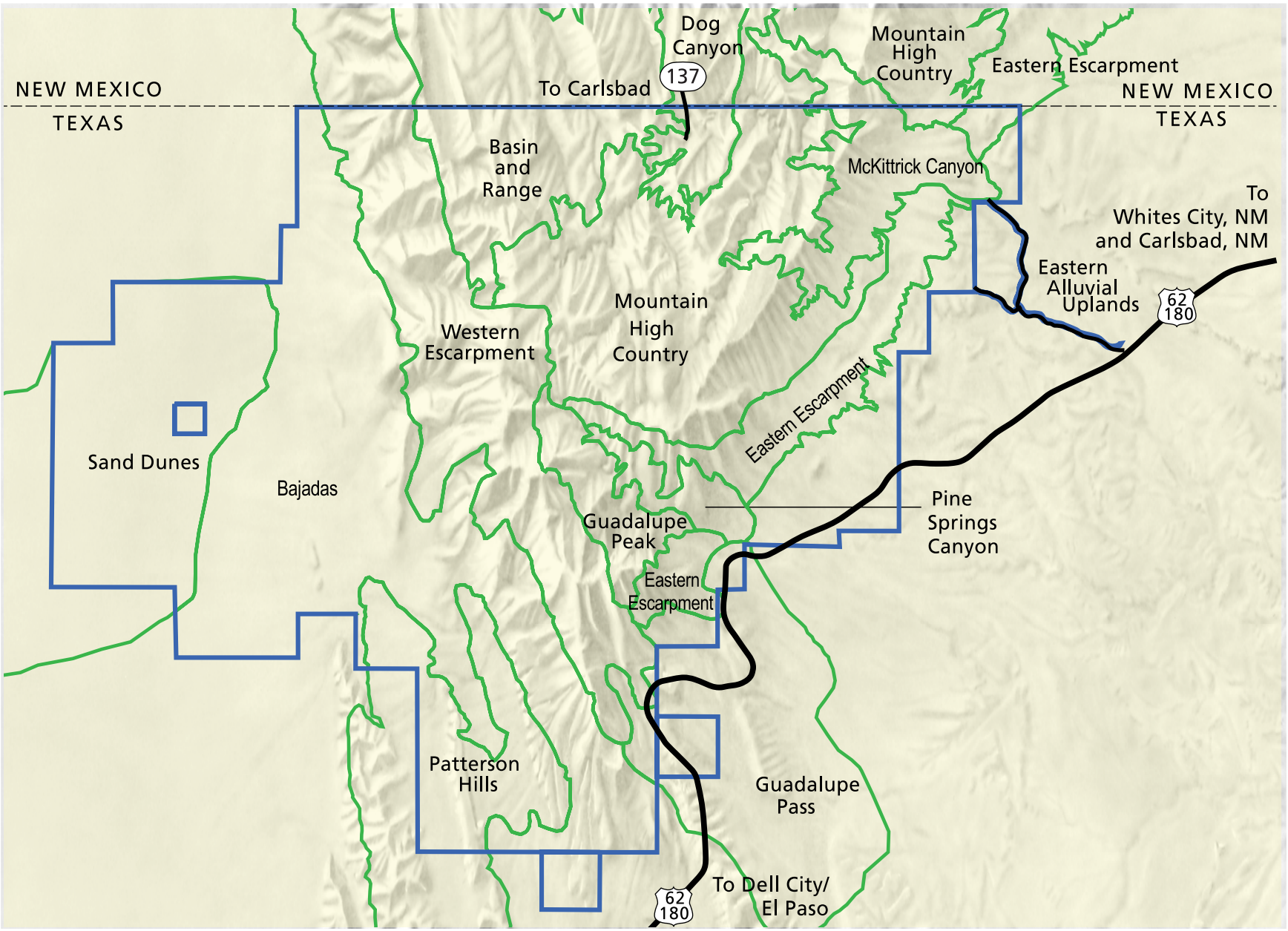
Pine Spring Canyon is a deep, rocky, steeply walled canyon containing a deciduous woodland habitat. Erosion has exposed formations containing a wide variety of fossils. The park's main visitor center at the mouth of Pine Spring Canyon provides information about the park's varied flora and fauna. The short Pinery Nature Trail starts at the visitor center and leads to the ruins of the Pinery, an 1850s stage station. Several longer trails, including the Guadalupe Peak, El Capitan, Devils Hall, Frijole, Salt Basin Overlook, Foothills, and Tejas Trails, begin at the Pine Springs trailhead. Campsites for recreational vehicles and tents are available.

Management issues:

- There are no fuel, food services, or overnight accommodations in or adjacent to the park, except for the Pine Springs recreational vehicle and tent camping sites.
- Hikers experience overcrowding and inadequate parking at the Pine Springs trailhead because recreational vehicle campers share the parking lot.
- Capacity and support facilities for recreational vehicle camping use at the Pine Springs trailhead are inadequate. There is no sanitary dump station for recreational vehicles and potable water facilities are inadequate for filling the water tanks of recreational vehicles.
- Cultural and natural resources in the vicinity of the Pine Springs trailhead and campground are subject to impacts from visitor use.
- The shared visitor center and headquarters building north of the highway has inadequate operational and administrative office space.
- Family and group picnic facilities in Pine Springs vicinity are inadequate.

East Alluvial Uplands

Alluvial uplands are at the foot of the Guadalupe Mountains' eastern escarpment. The many springs that emerge here are critical to the survival of wildlife and supported early human residents. Pinyon-juniper habitat is mixed with semi-desert grasslands.



0 5 Miles

Landscape Units

Guadalupe Mountains National Park

United States Department of the Interior / National Park Service

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Frijole Ranch, just east of Pine Springs, is a historic ranch complex that includes a well-preserved ranch house that was converted by the National Park Service into a museum. The museum depicts the history of diverse human influences on the area. The shaded grounds provide a favorite resting and birding area.

A short walk to the northeast leads to Manzanita Spring. Farther north is Smith Spring at the base of the escarpment. The water at both sites was important to American Indians, who left evidence of their presence in rock ring middens, rock art, and flaking sites. Nearby Nipple Hill is one of the internationally significant geologic stratotypes.

East along the uplands is Ship-on-the-Desert, a house built for the petroleum geologist Wallace Pratt that was designed to resemble an oil tanker. The house is used as a research facility and provides dormitory housing for visiting park researchers, housing for volunteers and, occasionally, space for educational seminars or park-sponsored meetings.

Management issues:

- Because the Frijole Ranch farmhouse is used as a museum, the historic buildings and landscape are no longer maintained or fully interpreted as a historic ranch.
- Parking near Frijole Ranch also serves Smith Spring Trail and a variety of frontcountry and backcountry trails. Parking capacity is inadequate and support facilities are lacking.
- Picnic activities in the area are not supported by adequate facilities and are incompatible with management of the historic landscape.
- The desired condition for the Ship-on-the-Desert building and landscape need to be determined with regard to preservation and meeting operational needs.

Eastern Escarpment

The eastern escarpment is a 2,500-foot-high, rocky, mountain face with sparse vegetation. Access to the escarpment is limited by the rugged terrain and few established trails. The steep Bear Canyon Trail affords hikers a sense of the ruggedness and great views south of the park.

The Bear and Smith Canyons serve as seasonal access corridors for elk and provide shelter for exotic aoudad sheep. Rock outcrops and caves provide geologic and paleontological research opportunities and bat habitat. Rock shelters along the mountainside are important archeological sites, as are the historic water pipelines and tanks.

Management issues:

- Bear Canyon Trail, like most of the park's trail routes to the upland mountain plateau, is extremely steep and exposed and requires frequent maintenance.

McKittrick Canyon

A visitor contact station is at the mouth of McKittrick Canyon. The center provides access to the short McKittrick Nature Trail, the McKittrick Canyon Trail, and the Permian Reef Geology Trail that goes to the top of Wilderness Ridge and offers a self-guided geology tour and has a designated backcountry campground that is available by permit.

A hike up the canyon is a special experience that features a perennial stream, fragile riparian ecosystems, interesting geologic features and fossils, a rich diversity of wildlife, and vegetation that includes Texas madrones, alligator junipers, ponderosa pines, and the endemic yellow Chapline's columbine and regal red penstemon. Maples, walnuts, ash, chokecherry, and oak brighten the canyon with their fall colors. The relatively gentle trail takes hikers from desert scrub to forest.

A major destination on the trail is the historic Pratt Cabin, 2.5 miles up the canyon. Beyond Pratt Cabin are the Grotto, with limestone formations and stone picnic tables, and the historic Hunter Line Cabin, a relic of the canyon's ranching era.

The water in McKittrick Canyon was important to American Indians, who left evidence of their presence in rock ring middens, rock art, and flaking sites. The McKittrick Canyon Archeological District, which is listed in the National Register of Historic Places, is located near the confluence of the North and South McKittrick Canyons.

Management issues:

- The McKittrick Canyon Trail is one of the park's most popular trails because of moderate slopes, seasonal color, and proximity to a perennial stream. As a result, this trail is periodically impacted by heavy use.
- Determine the desired condition for Pratt Cabin and its landscape to preserve the resource, meet operational needs, and provide visitor satisfaction.
- Determine if there is a need for sanitary facilities at Pratt Cabin and, if so, what type of facilities would have the least impact.
- The McKittrick Canyon contact station and interpretive displays, including the nature trail, are outdated and limited in their interpretive messages.
- Determine proper maintenance levels and techniques for the Permian Reef Geology Trail to maintain its integrity as a published, interpreted outdoor exhibit.
- The NPS-era power line to Pratt Cabin detracts from the natural beauty of the canyon and interrupts scenic vistas.

Mountain High Country

The high country, a dissected upland plateau of rock cliffs, rolling hills, and grassy valleys, treats visitors to an exceptional experience after they have conquered the 2,500-foot-high climb from the desert. Most of the area is designated wilderness. Its edges are noted for scenic vistas and the interior is a dense relict forest of ponderosa pine, southwestern white pine, Douglas-fir, and one vestigial stand of quaking aspen.

The forest is especially lush in the "Bowl," a 2-mile-wide depression. In summer, elk and mule deer graze. Black bears and mountain lions are year-round inhabitants. Historic cabins and water pipelines and tanks from the bygone ranching era dot the landscape, along with rock ring middens, hearths, and flaking sites left by American Indians. The wilderness trail system provides access to seven of the park's 10 primitive backcountry campsites, which are available by permit.

Management issues:

- Designated backcountry campsites, particularly those nearest to trailheads, are impacted by visitor overuse.
- Evidence of historic roads and dilapidated water distribution equipment is present throughout the mountain high country wilderness. These features require evaluation and a determination of significance.
- Some backcountry trails, such as the northwest section of Bush Mountain Trail, have become overgrown with brush, resulting in hikers losing their way.

Dog Canyon

Dog Canyon is a small, narrow, secluded area on the northern border of the park. It is accessible from Carlsbad, New Mexico, which is more than 60 miles away, by New Mexico Highway 137. Facilities include a ranger station, campground, picnic area, trailhead, and visitor horse corrals.

Dog Canyon Spring is one of the few dependable water sources in the area. As a result, it attracts wildlife, including deer, mountain lion, and quail. The water was im-

portant to American Indians, who left evidence of their presence in rock ring middens, rock art, and flaking sites. Historic copper mines and abandoned homesteads are more recent historic remains.

The 0.6-mile-long Indian Meadow Nature Trail provides an introduction to the flora and fauna of the Dog Canyon area. The Tejas Trail offers access to the high mountain plateau country. The remote northwest side of the park can be reached using the Bush Mountain Trail.

Management issues:

- Dog Canyon is a rich area of resources that could support a wider range of facilities and visitor experiences than are currently available.
- Part of the Dog Canyon campground is located in a flood hazard zone.

Basin and Range

This area, which includes PX Flat and the Brokeoff Mountains, is some of the most isolated in the park. A Great Basin coniferous woodland covers the more gently rounded hills of the Basin and Range and includes the endemic Guadalupe mountain laurel and isolated stands of one-seed juniper. Coyotes, foxes, and badgers inhabit this area, which has restoration potential for black-tailed prairie dog and pronghorn antelope.

Scattered archeological flaking sites, hearths, and rock ring middens can be found, along with the Cox Cabin and remnants of the Marcus sheep cabin and corral. A small section of the Bush Mountain Trail follows the eastern edge of this area and provides access to the Marcus Campground, which is one of the park's backcountry campgrounds that are available by permit.

Management issues:

- Park resources are isolated and accessible only with substantial effort.

Western Escarpment / Guadalupe Peak

The rugged, remote western escarpment was uplifted 20 and 30 million years ago along a huge fault, and forms a striking scenic backdrop to the wide desert flats. The western aspect is an almost sheer vertical face, and the eastern aspect slopes toward the park's high country. Jagged, 2,000-foot-high cliffs provide protected habitat for golden eagles, peregrine falcons, and other unique animal and plant species, like the five-flowered rock daisy and the Guadalupe pincushion cactus. Water is extremely scarce.

Guadalupe Peak, which stands a full mile above the floor of the basin to the west, and El Capitan are major features at the southern end of the escarpment. The rewards of the strenuous hike up Guadalupe Peak include stunning views of more than 80 miles.

Most hikers access the escarpment from Pine Springs via the Guadalupe Peak Trail, which has a primitive campground a mile below the summit. The Bush Mountain Trail extends along the top of the escarpment.

Stratotype Canyon within the escarpment is an internationally known standard for Middle Permian rocks. The escarpment's high caves are known to have significant paleontological resources. In addition, the escarpment forms the mountainous ridge landscape of the White Painted Woman, which is culturally important to the Mescalero Apache people.

Management issues:

- The popular Guadalupe Peak trail is open to horse use and requires high levels of maintenance to keep it safe.

- Western escarpment geological resources are not accessible for many visitors.

Salt Basin Dunes

This dunes landscape is geologically young. It developed over thousands of years as dissolved salts and gypsum from the adjacent lakebed were deposited by the wind into ever-changing sculpted hill, wave, and ripple formations. Both white gypsum and red quartzose dunes dominate the landscape. Mesquite coppices, where the mesquite holds the dunes from blowing away, form stabilized spots where wildlife abounds. The dunes are home to gypsum-loving plant and animal life like gypsum scalebroom, a white variant of the lesser earless lizard, and five of the park's seven species of scorpions.

With their lower elevation, the dunes are generally warm in winter and dangerously hot in the summer. Numerous hearths, rock ring middens, and flaking sites attest to prehistoric use. This area has been identified by the Tigua Indians of Ysleta del Sur Pueblo as culturally and religiously significant. Water wells and windmills demonstrate more recent historic ranching uses.

This relatively new addition to the park has minimal access and no services. Visitors are allowed to hike over the open dunes, but are encouraged to avoid walking on the fragile black crust of the cryptobiotic and evaporitic soils. Visitors may also hike on abandoned ranch road traces and discover windmills and other historic remnants of the past.

Management issues:

- The dune area lacks nearby road and parking access.
- The area has very harsh conditions, particularly in summer months.
- The lack of services or facilities makes visitor use uninviting and limits visitor satisfaction and understanding.
- The need to protect sensitive natural and cultural resources must be considered in the determination of appropriate visitor access and use capacity.
- The existing access road floods for several months at a time, preventing visitor or staff access to this area of the park.

Bajadas / Patterson Hills

The Bajadas are a broad apron of alluvial deposits laced with deep arroyos. The Patterson Hills, a series of north-south trending low hills adjacent to the Bajadas, are downfaulted remnants of the Permian reef. The area is typical of the arid Chihuahuan Desert, and includes creosote bush, agaves, prickly pear and many other varieties of cacti, chollas, yuccas, and stotol. Common wildlife includes snakes, kangaroo rats, coyotes, and mule deer.

Historic resources include gas and water well sites and equipment, the Butterfield Stage Route, and the early 1900s Williams Ranch. The latter provides a view of living and working in this rugged, stark, desert environment. The primitive (four-wheel-drive) access road provides a unique opportunity for visitors to experience the remoteness and solitude of the western Bajadas and Williams Ranch. El Capitan Trail and Shumard Campground (a backcountry campground that is available by permit) can be accessed from the ranch. The PX Well and Pure Well areas also have primitive camping by permit.

Management issues:

- There is no all-weather road, and low-clearance vehicles cannot access this area of the park. This substantially limits potential visitor experiences.
- Williams Ranch provides a unique visitor experience but the primitive road condition limits visitor access to this area.

Guadalupe Canyon and Pass

Guadalupe Canyon and Pass represent a "crossroads in time," serving as a transportation route and a landmark for generations of historic and prehistoric peoples. The Guadalupe Pass route snakes between the Guadalupe Mountains and the Delaware Mountain ridge to the south, and then follows Guadalupe Canyon as it drops more than 2,000 feet to the salt flats west of the park.

The current route of U.S. Highway 62/180 over Guadalupe Pass diverges from the historic route, but still passes through some of the park's most spectacular scenery. Road cuts show cross-sections of the area's geologic story, and a double rest area along U.S. Highway 62/180 affords spectacular views of El Capitan and Guadalupe Peak. The image of Our Lady of Guadalupe that some can see on the face of El Capitan is important to contemporary Hispanic groups. A small parking area along the road outside the park on the busy right-of-way provides access to the Salt Basin Overlook Trail, El Capitan Trail, and Guadalupe Canyon across private land.

In the shadow of the fabled El Capitan, reminders of the passing American Indian travelers remain in the form of rock art, rock ring middens, hearths, and flaking sites. More recent features include the Butterfield Stage route, the old historic highway, historic dugouts, and the army scout Polancio's grave. An internationally significant geological stratotype section occupies an adjacent hilltop, and many other important paleontological sites are to be found nearby.

Management issues:

- This natural and cultural area is bisected by a state highway and is checkered with private lands, making access discontinuous and difficult.
- Access to this part of the park is across private land by informal agreement.
- Limited opportunities to safely park vehicles and access park trails and other features.

The Salt Flats

IMPACT TOPICS – RESOURCES AND VALUES AT STAKE IN THE PLANNING PROCESS

Specific resources and values were used to focus the planning process and the assessment of potential consequences of the alternatives. The following four criteria were used to determine the resources and values at stake in the Guadalupe Mountains National Park general management planning process:

- Resources cited in the legislation that authorized Guadalupe Mountains National Park, and other legislation relating to the park, all of which is provided in appendix A. The relevant elements of the legislation are incorporated in the "Park Purpose" and "Park Mission" provided earlier in this chapter.
- Resources critical to maintaining the significance and character of the park. The "Park Significance" statements provided earlier in this chapter describe the defining features of Guadalupe Mountains National Park that were used to establish the resources critical to maintaining the park's significance and character.
- Resources recognized as important by laws or regulations. A list of many of the important congressional acts and executive orders that guide the management of all NPS facilities, including this park, is provided in appendix B. The relevant elements of these acts and orders as they relate to conditions to be achieved at Guadalupe Mountains National Park are included in appendix C.
- Values of concern to the public during scoping for the general management plan. As described in Chapter 5, the National Park Service conducted a public information and scoping program to acquire input from the public and other agencies. This helped the National Park Service develop alternatives and identify resources and values of high interest in the park.

When resources and values are analyzed by the National Park Service in an environmental impact statement, they are referred to as "impact topics." A brief rationale for the detailed discussion of each impact topic, or for its dismissal from further consideration, is given below.

TOPICS TO BE DISCUSSED

Natural Resources

Soils, Plant Communities and Vegetation, and Wildlife. The 1969 National Environmental Policy Act is the national charter for protection of the environment. It requires federal agencies to use all practicable means to restore and enhance the quality of the human environment and to avoid or minimize any possible adverse effects of their actions on the environment. NPS policy is to protect the natural abundance and diversity of all of the park's naturally occurring communities.

The National Park Service actively seeks to preserve the soil resources of Guadalupe Mountains National Park and to prevent, to the extent possible, the unnatural erosion, physical removal, and contamination of soils. NPS goals for the management of biological resources in Guadalupe Mountains National Park and all other units of the national park system are provided in *Management Policies 2006* (NPS 2006b) and include

- preserving and restoring the natural abundances, diversities, dynamics, distributions, and habitats of native plant and animal populations and the communities and ecosystems in which they occur
- restoring native plant and animal populations in parks when they have been extirpated by past human-caused actions
- minimizing human impacts on native plant and animal populations, communities, and ecosystems, and the processes that sustain them

Because all alternatives for management of the park would involve soils, plant communities and vegetation, and wildlife, impacts on these topics have been evaluated in this document.

Geologic Resources. Section 4.8 of *Management Policies 2006* (NPS 2006b) states that "The Park Service will preserve and protect geologic resources as integral components of park natural systems. As used here, the term 'geologic resources' includes both geologic features and geologic processes. The Service will (1) assess the impacts of natural processes and human-related events on geologic resources; (2) maintain and restore the integrity of existing geologic resources; (3) integrate geologic resource management into Service operations and planning; and (4) interpret geologic resources for park visitors."

Management Policies 2006 (NPS 2006b) require the National Park Service to analyze the impacts of proposed actions on geologic resources. Some of the proposed actions in the alternatives for Guadalupe Mountains National Park could involve modifications to access roads, facilities, and trails. These activities could enlarge the footprint of disturbed areas or create new disturbed areas. Some activities might require minimal blasting or other modification of bedrock geology, and could change the distribution and intensity of geological processes. (Site-specific, future environmental compliance documents would be prepared as needed.) For these reasons, geologic resources were analyzed in this document.

Paleontological Resources. In part, *Management Policies 2006* (Section 4.8.2.1) states

> Paleontological resources, including both organic and mineralized remains in body or trace form, will be protected, preserved, and managed for public education, interpretation, and scientific research. The Service will study and manage paleontological resources in their paleo-ecological context.

Information on paleontological resources in Guadalupe Mountains National Park was compiled from park records, scientific publications, and consultation with recognized experts. Regardless of which alternative is implemented the National Park Service will:

- Undertake a paleontological inventory and survey, including information on paleontological research that has already been performed in the park, lists of fossil species found in the park, maps of high probability areas expected to produce fossils, recommendations for future research, identification of threats to fossil resources, and strategies for their protection.
- Prepare a paleontology site layer for the park's geographic information system (that is, a database of fossil localities that have been excavated or are known to contain fossils).

Although extensive precautions would be conducted to protect paleontological resources, the potential exists for the alternatives to impact unknown resources. Additionally, impacts might be unavoidable in some areas. Therefore, impacts to paleontological resources have been analyzed in this document.

Cultural Resources

The National Historic Preservation Act and the National Environmental Policy Act require that the effects of any federal undertaking on cultural resources be examined. Also, *Management Policies 2006* (NPS 2006b) and *Director's Order #28: Cultural Resource Management* (NPS 1998a) call for the consideration of cultural resources in planning.

Chapter 5 of *Management Policies 2006* (NPS 2006b) addresses cultural resource management. Consistent with the guidance in this chapter, cultural resource management at Guadalupe Mountains National Park includes

- research to identify, evaluate, document, register, and establish basic information about cultural resources and traditionally associated peoples
- planning to ensure that management processes for making decisions and setting priorities integrate information about cultural resources and provide for consultation and collaboration with outside entities
- stewardship to ensure that cultural resources are preserved and protected, receive appropriate treatments (including maintenance) to achieve desired conditions, and are made available for public understanding and enjoyment

Actions proposed in this plan could affect archeological resources, historic structures, cultural landscapes, ethnographic resources, and museum collections. Therefore, these topics have been analyzed in this document.

According to Executive Order 13007 on "Indian Sacred Sites" (1996), the National Park Service will accommodate, to the extent practicable, access to and ceremonial use of Indian sacred sites by religious practitioners from recognized American Indian tribes and will avoid adversely affecting the physical integrity of such sacred sites. There are 13 tribes that have identified traditional associations with lands in the Guadalupe Mountains National Park. In particular, the Tigua or Ysleta del Sur Pueblo and the Mescalero Apache tribes have stated that some of these lands continue to be of spiritual and religious significance. Knows sites that may be important to the tribes could be affected by the actions proposed in the alternatives. For this reason, impacts on sacred sites have been analyzed under the topic of ethnographic resources.

Visitor Use and Experience

Providing for visitor enjoyment, understanding and stewardship is one of the fundamental purposes of the National Park Service. Many actions proposed in this management plan could affect patterns of visitor use and the type and quality of visitor experiences. Specific elements of the visitor experience include visitor access, activities and destinations, orientation and interpretation, recreation, and visitor services, including camping and lodging. However, impacts in other topics, such as wildlife and the availability of wildlife viewing, also could affect visitor experience.

Socioeconomic Environment

The National Environmental Policy Act requires an examination of social and economic impacts caused by federal actions. Businesses in nearby communities and counties could be affected by actions proposed in this management plan. In addition, the alternatives could affect regional economic and demographic conditions, and components such as housing and community infrastructure. For these reasons, the impacts to the socioeconomic environment have been analyzed in this document.

National Park Operations and Facilities

The alternatives proposed in this plan could affect NPS operations and facilities in Guadalupe Mountains National Park, particularly operations, facilities, operational efficiency, and administrative access to the museum collection. For this reason, impacts to NPS operations and facilities have been analyzed in this document.

TOPICS DISMISSED FROM FURTHER CONSIDERATION

Some impact topics that commonly are considered during the planning process were not relevant to this general management plan for Guadalupe Mountains National Park, either because the resource does not occur in the park or because implementing the alternatives would have only a negligible or minor effect on the topic or resource. These topics are as

follows, along with a brief rationale for dismissing them.

Air Quality

The 1963 Clean Air Act, as amended (42 *United States Code* 7401 *et sequens)*, requires federal land managers to protect park air quality. *Management Policies 2006* (NPS 2006b) address the need to analyze air quality during park planning.

- The Clean Air Act provides that the federal land manager has an affirmative responsibility to protect the park's air-quality-related values from adverse air pollution impacts. These values include, but may not be limited to, visibility, plants, animals, soils, water quality, cultural and historic resources and objects, and visitor health.
- Section 118 of the Clean Air Act requires the park to meet all federal, state, and local air pollution standards.
- Section 176I of the Clean Air Act requires all federal activities and projects to conform to state air quality implementation plans to attain and maintain national ambient air quality standards.

Guadalupe Mountains National Park was designated a Class I airshed by the 1977 amendments to the Clean Air Act (Public Law 95-217). Class I airshed designation allows for very little deterioration in air quality, and is intended to protect areas of unique scenic value. In addition, under the terms of the Clean Air Act, the wilderness portion of Guadalupe Mountains National Park is designated Class I. The 1977 amendments require state implementation plans to protect visibility in a 100-kilometer (62-mile) region around Class I areas.

Should any of the action alternatives be selected, local air quality at project sites would be temporarily affected by dust and vehicle emissions from construction activities. Activities such as hauling materials and operating equipment during the construction period would result in increased vehicle exhaust and emissions.

Fugitive dust from construction equipment would intermittently increase airborne particulates near the project site, but loading rates would not be appreciable. To substantially reduce dust emissions, construction specifications would require the use of water or other dust-reducing agents. Additionally, compliance with all applicable codes and regulations would be mandatory. Other actions that would prevent or control particulate emissions during and after construction are listed in Chapter 2 under "Mitigative Measures."

Measures used to control construction equipment emissions could include, but not be limited to, using low-emission vehicles and low-pollution fuels, and limiting vehicle idling. Engine emissions of hydrocarbons, nitrogen oxides, and sulfur oxides that did occur would be rapidly dissipated by air currents, since air stagnation is rare within the park.

Because of air pollution control and mitigation measures, there would be a negligible, temporary reduction of local air quality associated with the action alternatives. These effects would last only during construction and until a stable soil cover was reestablished. The park's air quality would not be expected to experience any long-term, adverse effects. Therefore, air quality was dismissed as an impact topic.

Conflicts with Land Use Plans, Policies, and Controls

Section 4.5.F.2 of Director's Order #12 (NPS 2001a) states that an environmental impact statement must consider "possible conflicts between the proposal, and land use plans, policies, or controls for the area concerned

(including local, state, or Indian Tribe)." This requirement is based on Sections 1502.16 and 1506.2 (d) of the Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act.

Other jurisdictions that might have land use plans, policies, or controls that could affect, or be affected by, the management of Guadalupe Mountains National Park were identified earlier in this chapter under the heading "Relationship of Other Resource Planning and Management to This General Management Plan." Specific land use plans, policies, or controls of these jurisdictions that could relate to general management planning at the park are identified in Chapter 4 as part of "Cumulative Impacts and Projects that Make Up the Cumulative Impact Scenario."

The cumulative impact analysis for *each* impact topic includes, as appropriate, consideration of possible conflicts between the alternative and the land use plans, policies, or controls of others. Therefore, there was no need to evaluate this as a separate impact topic.

Ecologically Critical Areas, Such as Wild and Scenic Rivers

In the discussion of how to determine the significance of a proposed action, the Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act recommend evaluating unique characteristics, such as "proximity to … wild and scenic rivers, or ecologically critical areas" (Section 1508.27). There are no Congressionally designated wild and scenic rivers within or near Guadalupe Mountains National Park, and no other areas that would be considered ecologically critical. Therefore, this category was dismissed as an impact topic in this document.

Energy Requirements and Conservation Potential

None of the alternatives proposed in this general management plan would result in a measurable change in energy consumption compared to alternative A, no action / continue current management. None of the alternatives would substantially affect the park's energy requirements, because any rehabilitated or new facilities would take advantage of energy conservation materials and uses. Any changes in energy consumption resulting from the proposed actions would be negligible compared to the overall energy consumption of the park. Therefore, this topic was dismissed from further consideration.

The National Park Service would pursue sustainable practices whenever possible in all decisions regarding park operations, facilities management, and developments in Guadalupe Mountains National Park. This approach is consistent with the NPS' *Management Policies 2006* (NPS 2006b).

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/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. Guidelines for implementing this executive order under the National Environmental Policy Act are provided by the Council on Environmental Quality (1997). According to the U.S. Environmental Protection Agency (1998), environmental justice is:

> The fair treatment and meaningful involvement of all people, regardless of race, color, national origin, or income, with respect to the development, implementation, and enforcement of en-

> vironmental laws, regulations, and policies. Fair treatment means that no group of people, including racial, ethnic, or socioeconomic group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies.
>
> The goal of this "fair treatment" is not to shift risks among populations, but to identify potentially disproportionately high and adverse effects and identify alternatives that may mitigate these impacts.

There are both minority and low-income populations in the general vicinity of Guadalupe Mountains National Park. However, environmental justice is dismissed as an impact topic because:

- NPS staff actively solicited public participation as part of the planning process and gave equal consideration to input from all persons, regardless of age, race, income status, or other socioeconomic or demographic factors.
- The impacts associated with implementation of the preferred alternative would not disproportionately affect any minority or low-income population or community.
- Implementation of the preferred alternative would not result in any identified effects that would be specific to any minority or low-income community.
- The NPS staff does not anticipate that any adverse impacts on public health and/or the socioeconomic environment would appreciably alter the physical and social structure of the nearby minority or low-income populations or communities.

Floodplains and Wetlands

Executive Orders 11988 ("Floodplain Management") and 11990 ("Protection of Wetlands") require agencies to protect wetlands, examine impacts on floodplains and wetlands, and consider potential risks involved in placing facilities in floodplains. Protection of these resources also is required by the Rivers and Harbors Appropriation Act, Clean Water Act, and National Environmental Policy Act.

Guidelines for NPS managers on developments or other actions proposed in wetlands and floodplains are provided in

- *Management Policies 2006* (NPS 2006b)
- *Director's Order #12 and Handbook: Conservation Planning, Environmental Impact Analysis, and Decision Making* (NPS 2001a)
- *Director's Order #77-1: Wetland Protection* (NPS 2002) and its associated *Procedural Manual #77-1: Wetland Protection* (NPS 1998b)
- *Director's Order #77-2: Floodplain Management* (NPS 2003) and its associated *Procedural Manual #77-2: Floodplain Management* (NPS no date)
- Executive Order 11988, Floodplain Management
- Executive Order 11990, Protection of Wetlands

Floodplains. Guidance requires the National Park Service to preserve floodplain values and to minimize potentially hazardous conditions associated with flooding. Floodplains in Guadalupe Mountains National Park are limited to perennial and intermittent streams. The park occupies an area surrounding the highest point in Texas in a mountain range surrounded by the Chihuahuan Desert. Drainage is generally dispersed, rapid, and ephemeral; therefore, there are no 100-year or 500-year delineated floodplains in the park. Instead, low areas adjacent to ephemeral drainages in the larger watersheds are considered flash-flood zones. They present flooding hazards only when there are infrequent, high-volume storms.

The Pine Springs visitor center and campground and the Dog Canyon campground are within flash-flood zones. The National Park

Service has an emergency management plan that specifies under what conditions the visitor center and campgrounds should be evacuated. The plan also specifies when the park staff should implement various water control techniques, such as placing sandbags to direct water away from the visitor center.

The preferred alternative and alternative C propose moving the recreational vehicle and group camping facilities at Pine Springs to another location within the park to minimize the impacts of the campground on park resources, including the viewshed. Avoidance of the flash-flood zone would be a key criterion in siting the new campground. Because a site for the proposed new campground has not been identified, the impacts on floodplains that would be associated with the new campground are undetermined.

The action alternatives also propose new actions within the flash-flood zone in Dog Canyon. Under the preferred alternative, the group campsites would be improved. Under alternative C, the recreational vehicle and group campsites would be improved and the corral would be expanded. The proposed improvements would be in areas that are above historic flood levels.

Before these actions could be implemented, site-specific planning, including design and compliance with the National Environmental Policy Act, would occur. Site-specific planning would include developing mitigation measures to minimize risk to visitors, park resources, and property from flash floods to the extent practicable. In Dog Canyon, mitigation measures could include maintaining only those campsites located above historic flood levels. Mitigation measures that could be employed at both sites might include the following:

- Increase visitor education and outreach regarding risks and appropriate responses to flash floods in the park.
- Use nonstructural measures, such as sandbags and emergency notification, to reduce hazards to human life and property while minimizing impacts on the natural resources of flood zones.
- Ensure that structures and facilities are designed to be consistent with the intent and the standards and criteria of the National Flood Insurance Program (44 *Code of Federal Regulations* 60).

With the implementation of these mitigation measures, the long-term impacts on floodplain processes would be negligible or minor. For this reason, the impacts on floodplains related to the implementation of this general management plan are not analyzed further.

Wetlands. Guidance requires the National Park Service to protect and enhance natural wetland values and to examine the impacts of actions on wetlands. It is NPS policy to avoid affecting wetlands, and to minimize impacts when they are unavoidable. To facilitate this policy:

- All facilities would be located to avoid wetlands, if feasible.
- If avoiding wetlands was not feasible, other actions would be taken to comply with the guidelines cited previously, and with Section 404 of the Clean Water Act, which regulates the discharge of dredged or fill material into wetlands and other waters of the United States. These actions would include preparation of National Environmental Policy Act documentation and permitting under Section 404 of the Clean Water Act. It also could include design specifications to mitigate adverse impacts to the extent practicable.
- If the selected alternative would result in adverse impacts on wetlands, the National Park Service would prepare a statement of findings for wetlands. The statement of findings would include an analysis of the alternatives, a delineation of the wetlands, a wetland restoration plan to identify mitigation, and a wetland functional analysis of the impact site and restoration site.
- Compensation for remaining unavoidable adverse impacts on wetlands would be

made by restoring wetlands that previously were destroyed or degraded.

The small areas of wetlands within Guadalupe Mountains National Park are a vital part of the surrounding landscape. Wetlands include seeps and springs, permanent and intermittent streams, vernal pools, and small marshes at the mouths of canyons.

The action alternatives would include measures that would impact two wetland areas in the park: Manzanita Spring and Smith Spring.

Manzanita Spring. Manzanita Spring, near Frijole Ranch, has been actively manipulated, primarily by dredging, to maintain a large pond for at least 100 years and possibly longer.

- In alternative B, following Section 106 consultation, Manzanita Spring would be allowed to silt in over time.
- In the preferred alternative and alternative C, Manzanita Spring would continue to be dredged on a periodic basis to maintain the cultural landscape.

The impacts on other resources from allowing Manzanita Spring to silt in are unknown. However, a biological assessment conducted at Manzanita Spring indicated that, while the area is biologically important, there are no threatened or endangered species that would be adversely impacted if the configuration of the spring changed over time.

The continuation of periodic dredging under the preferred alternative or alternative C would produce long-term conditions that were similar to current conditions. Therefore, the *change* associated with continued dredging would be negligible. Dredging would have short-term adverse effects but, as they have in the past, the flora and fauna associated with the site would quickly recover. This dredging would maintain the character of the cultural landscape, which is listed in the National Register of Historic Places and which includes the spring as a component.

Manzanita Spring

Smith Spring. Smith Spring is upstream from Manzanita Spring and is part of a popular loop trail. The current trail alignment directs visitors to an area adjacent to the spring but minimizes impacts on the spring with handrails.

The current stepping stones on the trail that crosses the Smith Spring runoff have a negligible effect on the spring and its runoff. The well-placed and -maintained stepping stones have physical impacts that are similar to natural rocks in a stream and have low visual intrusion on the natural setting. Because foot traffic is channeled onto their surfaces rather than the stream bed, they are effective in protecting the water resource and related geological resources, such as travertine that might form.

The National Park Service would perform site-specific planning prior to implementing any construction at Manzanita Spring or Smith Spring. This would include appropriate Clean Water Act, National Environmental Policy Act and National Historic Preservation Act, Section 106 compliance, including analysis of site-specific impacts. Because the effects of actions at these sites would have no greater than minor intensities, and because impacts would be investigated in depth during site-specific planning, wetlands were dismissed from further analysis at the general management planning level.

Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts on Indian trust resources from a proposed project or action by agencies of the Department of the Interior 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 in Guadalupe Mountains National Park. The lands comprising the park are not held in trust by the Secretary of the Interior for the benefit of Indians due to their status as Indians. Therefore, Indian trust resources were dismissed as an impact topic.

Lightscape Management

In accordance with Section 4.10 of *Management Policies 2006* (NPS 2006b), the National Park Service strives to preserve natural lightscapes, which are natural resources and values that exist in the absence of human-caused light. At Guadalupe Mountains National Park, the National Park Service strives to

- limit the use of artificial outdoor lighting to that which is necessary for basic safety requirements
- ensure that all outdoor lighting is shielded to the maximum extent possible
- keep light on the intended subject and out of the night sky

The actions proposed in the alternatives would not affect the existing exterior lighting of the visitor center or parking area.

More lighting would be used for the new recreational vehicle and group campground, with hook-ups and more restrooms. Impacts would be negligible to minor because the lights would be shielded, directed to keep light on the intended subject, and localized in the area of the campground. As a result, light from the campground would not adversely affect the night sky elsewhere in the park.

There could be an indirect impact on the night sky from automobiles on the road from Williams Ranch to Dell City (proposed in alternative C). These impacts would be negligible to minor because use of the road at night would be infrequent. Therefore, lightscape management was dismissed as an impact topic.

Prime and Unique Farmland

The Council on Environmental Quality (1980) directed that federal agencies must assess the effects of their actions on farmland soils classified by the United States Department of Agriculture's Natural Resources Conservation Service as prime or unique.

- Prime farmland has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops.
- Unique land is land other than prime farmland that is used for production of specific high-value food and fiber crops.

According to the Natural Resources Conservation Service, there are no prime farmlands associated with Guadalupe Mountains National Park. Therefore, prime and unique farmland was dismissed as an impact topic.

Public Health and Safety

In the discussion of how to determine the significance of a proposed action, the Council on Environmental Quality (1978) regulations for implementing the National Environmental Policy Act require consideration of "The degree to which the proposed action affects public health or safety."

At Guadalupe Mountains National Park, public health and safety already are addressed in a variety of plans and regulations. Examples include the park's fire management plan (NPS 2005) and the superintendent's compendium, prepared to comply with Title 36, *Code of Federal Regulations*, Chapter 1, Parts 1 through 7.

Under any of the alternatives, including alternative A, no action / continue current management, the plans and regulations that affect health and safety would remain in effect, and their character and scope would not change. Therefore, the proposed alternatives would have a negligible impact on public health and safety. For this reason, public health and safety has not been further analyzed in this document.

Soundscape Management

In accordance with Section 4.9 of *Management Policies 2006* (NPS 2006b), preservation of natural soundscapes associated with national park system units is an important part of the NPS mission.

Natural soundscapes exist in the absence of human-caused sound. The natural 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 system units, as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas.

Hauling material, operating equipment, and conducting other construction activities in association with implementing the action alternatives would increase human-caused sounds. Construction sounds would be temporary, lasting only as long as the construction activity.

To minimize noise impacts, the National Park Service would require each contractor to develop and implement a construction noise and vibration control plan. Typical measures that could be implemented to minimize construction noise would include

- requiring equipment to be in good working order with properly functioning mufflers
- employing acoustical shrouds, such as noise-reducing blankets or hay-bale

shields, around noisy equipment such as air compressors
- installing noise baffling devices on heavy construction during activities such as excavation and grading

With mitigation in effect, construction sounds would have a short-term, adverse, negligible to minor impact on visitor enjoyment in developed areas in and near construction sites. In areas with visitor centers and other visitor amenities, visitors typically do not expect natural sound conditions.

Sounds from wilderness and backcountry trail construction would be minimized by rigorously applying minimum tool standards. As a result, the short-term, adverse effects from construction would have negligible to minor intensity.

Because of the minimal effects that the alternatives would have on the park's natural quiet, soundscape management was dismissed as an impact topic.

Special Status Species (Threatened and Endangered Species, Species of Concern, and Designated Critical Habitats)

The Endangered Species Act (1973), as amended, requires an examination of impacts on all federally listed threatened or endangered species. Section 4.4.2.3 of *Management Policies 2006* (NPS 2006b) also requires the inventory, monitoring, and management of other categories of special status species, including federal candidate species, state- and locally listed species, and species of special concern to parks, such as rare, declining, sensitive, or unique species, and their habitats.

The most recent information available from the U.S. Fish and Wildlife Service (2007) was obtained to identify species that are federally listed as threatened or endangered. Four such species were identified in Culberson and Hudspeth Counties. However, only one, the threatened Mexican spotted owl (*Strix occidentalis lucida*) is of concern within Guadalupe Mountains National Park. Critical habitats have been designated for this species, but all critical habitats are located outside Texas (U.S. Fish and Wildlife Service 2007).

Salt Basin Dunes

Most of the special status plants and animals in Guadalupe Mountains National Park inhabit areas largely away from existing park development, backcountry trails, and campsites. These areas would not be altered or developed under any of the alternatives. Therefore, proposed actions such as new or upgraded picnic areas, campgrounds, roads, trailheads, and restrooms could be implemented without affecting these species of concern

A few state-listed special status plant species, including the gypsum scalebroom and McKittrick pennyroyal, grow close to existing roads or trails. Before the National Park Service implemented any disturbance under any of the alternatives, it would prepare a detailed development plan and would perform biological surveys. If individuals of these species were detected, the plan would be revised to protect them through avoidance. Therefore, special status species were dismissed as an impact topic in this document.

Species Restoration, Exotic Species Control, and Extirpated Species Reintroduction

Section 4.4.1.3 of *Management Policies 2006* (NPS 2006b) states:

> Native species are defined as all species that have occurred, now occur, or may occur as a result of natural processes on lands designated as units of the national park system. Exotic species are those species that occupy or could occupy park lands directly or indirectly as the result of deliberate or accidental human activities. Exotic species are also commonly referred to as nonnative, alien, or invasive species. Because an exotic species did not evolve in concert with the species native to the place, the exotic species is not a natural component of the natural ecosystem at that place.

Exotic species are of concern because they can displace native species and disturb the natural ecosystem. Management and control of plant and animal exotic species, up to and including eradication, are undertaken wherever such species threaten park resources or public health and when control is prudent and feasible.

Guadalupe Mountains National Park has approved plans and programs to manage the restoration of certain species; control the introduction, manage, and effect removal of exotic species; and reintroduce extirpated species where possible. These plans and programs would continue to be implemented regardless of which alternative was selected.

The management of species reintroduction, exotic species control, and reintroduction of extirpated species is governed by laws, policies, and mandates. None of the proposals associated with general management planning would result in change or further management action. Implementation of the action alternatives may produce beneficial, long-term effects on native species. Therefore, this impact was dismissed from further consideration.

Water Quality and Quantity (Surface and Groundwater)

Surface water is scarce in Guadalupe Mountains National Park. Most streams in the park flow intermittently. Water used in park facilities is obtained from groundwater.

While some construction associated with the action alternatives could change water quality, the impacts would be short-term and would be minimized through mitigation. For example, sedimentation basins and silt fences would be used to prevent sediment in runoff from reaching waterways, and temporary ground covers, such as erosion matting or weed-free straw, would be installed to protect soil until a natural vegetative cover was reestablished.

In the long-term, the new or upgraded facilities associated with the action alternatives would increase the volume of water used by visitors. However, because this adverse effect would involve only a few gallons per person per day, it would not cause detectable hydrogeological changes, even locally, and would be of negligible intensity. Trail maintenance would be beneficial to water quality, but the intensity would be negligible or minor because the improvements would occur only during the relatively infrequent wet periods and only for a short distance downstream from the action.

In addition, the park staff has initiated actions to protect water quality in the park from management and visitor-related activities. For example, a potential source of nonpoint source pollution in the park is horse manure from both park and visitor animals. To reduce the potential impacts of nonpoint source pollution from horse manure in the park, park staff removes all manure from the park corrals daily. Park staff will also remove horse manure from public corrals if the visitors fail to do so. Similarly, horses are not allowed in McKittrick Canyon, the area with a trail and a primary perennial source of water.

None of the alternatives would substantially change the quantity or quality of the park's surface or groundwater sources in either the short or long term. For this reason, impacts on water quality and quantity were eliminated from further consideration.

Wilderness Resources and Values

The NPS' wilderness management policies are based on statutory provisions of the 1916 Organic Act, the 1964 Wilderness Act, and legislation establishing individual units of the national park system. Section 6 of *Management Policies 2006* (NPS 2006b) requires that "Wilderness considerations will be integrated into all planning documents to guide the preservation, management, and use of the park's wilderness area and ensure that wilderness is unimpaired for future use and enjoyment as wilderness." Among the attributes of wilderness is protection of wilderness character, including opportunities for solitude and a primitive, unconfined type of recreational experience.

The action alternatives call for providing additional trail access in designated wilderness and backcountry areas within the Guadalupe Mountains National Park. Short-term, adverse effects on wilderness resources and values would result from construction activities, including limited use of dynamite and rock drills. However, because these highly transitory activities would be timed to minimize disturbances to other resources and the wilderness experience, the intensity of the impact would be negligible.

In the long term, the proposed improvements in the trails would improve safe access to wilderness areas. Past projects have reduced the number of people who must be rescued from the backcountry, and similar results would be expected from future improvements.

Upgrades of the formal trail system also would reduce the likelihood of visitors creating their own trails, commonly called "social trails." Because social trails do not include any provisions for stability or erosion control, they typically produce soil losses and vegetation trampling, and can damage cultural and paleontological resources. Environmental planning and compliance would be completed as appropriate prior to any of the proposed trail upgrades.

These actions would result in long-term, beneficial impacts because visitors could continue to access wilderness areas while wilderness values and character would continue to be preserved future generations. Consequently, the topic of wilderness values was dismissed in this document.