



Proposed Vehicle Barrier Environmental Assessment

April 2003

Organ Pipe Cactus National Monument



Coronado National Memorial



Proposed Vehicle Barrier

Environmental Assessment

Organ Pipe Cactus National Monument / Coronado National Memorial • Arizona

The purpose of and the need for taking action is to evaluate a range of alternatives and strategies to ensure the protection of park resources and values by preventing illegal vehicular traffic from Mexico in Organ Pipe Cactus National Monument and Coronado National Memorial. The National Park Service is proposing to construct a vehicle barrier adjacent to the international border within Organ Pipe Cactus National Monument and in Coronado National Memorial. The purposes of this barrier are (1) to protect the fragile desert environments at both park units from adverse effects caused by illegal drug smuggling by vehicles crossing the international border, and (2) to protect the health and safety of visitors and federal employees.

Under alternative B, the preferred alternative, a vehicle barrier consisting of three different designs would be installed along 30 miles of international border at Organ Pipe Cactus National Monument and approximately 1 mile at Coronado National Memorial. The barrier would consist of railroad rail cross pieces placed 3 feet high and anchored to upright posts. The barrier would be designed so as not to negatively impact wildlife, including threatened or endangered species.

Adverse, short-term impacts due to construction activities would occur under the preferred alternative at both park units. These impacts would range in intensity from negligible to moderate. However, long-term impacts due to the reduction or elimination of illegal off-road activity would be beneficial, ranging from minor to moderate impacts at both park units. Impacts on natural resources would be reduced and impacts on visitor experiences, as well as the health and safety of all people visiting or working in the parks, would be improved. Cumulative impacts would be expected primarily from U.S. Border Patrol operations planned in the areas of the parks. No impairment of any park resources at either Organ Pipe Cactus National Monument or Coronado National Memorial is expected.

Public Comment. If you wish to comment on the environmental assessment, you may mail comments to the name and address below. This environmental assessment will be on public review for 30 days. Please note that names and addresses of people who comment become part of the public record. **If you wish us to withhold your name or address, you must state this prominently at the beginning of your comment.** We will make all submissions from organizations, businesses, and from individuals identifying themselves as representatives or officials of organizations or businesses available for public inspection in their entirety.

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PURPOSE AND NEED

INTRODUCTION

Organ Pipe Cactus National Monument was established on April 13, 1937, to protect the life and landscape of the Sonoran Desert in southwestern Arizona. Within the national monument's boundaries is a vast collection of Sonoran Desert plants, including the organ pipe cactus, a large cactus rarely found in the United States. The monument, which encompasses more than 330,000 acres, is also home to many animals that have adapted to extreme temperatures, intense sunlight, and little rainfall. Organ Pipe Cactus was designated an international biosphere reserve on October 26, 1976, and about 94% of the monument (about 312,000 acres) was designated as wilderness on November 10, 1978. The national monument shares 30 miles of international border with Mexico.

Coronado National Memorial was established as an international memorial on August 18, 1941, and as a national memorial on November 8, 1952, to commemorate the first major European exploration of the American Southwest. Located on the U.S.-Mexican border, the memorial is a cultural area in a natural setting composed of 4,750 acres of semi-desert grasslands and oak woodlands in Montezuma Canyon at the southern end of the Huachuca Mountain Range. Coronado National Memorial shares approximately 3.3 miles of international border with Mexico.

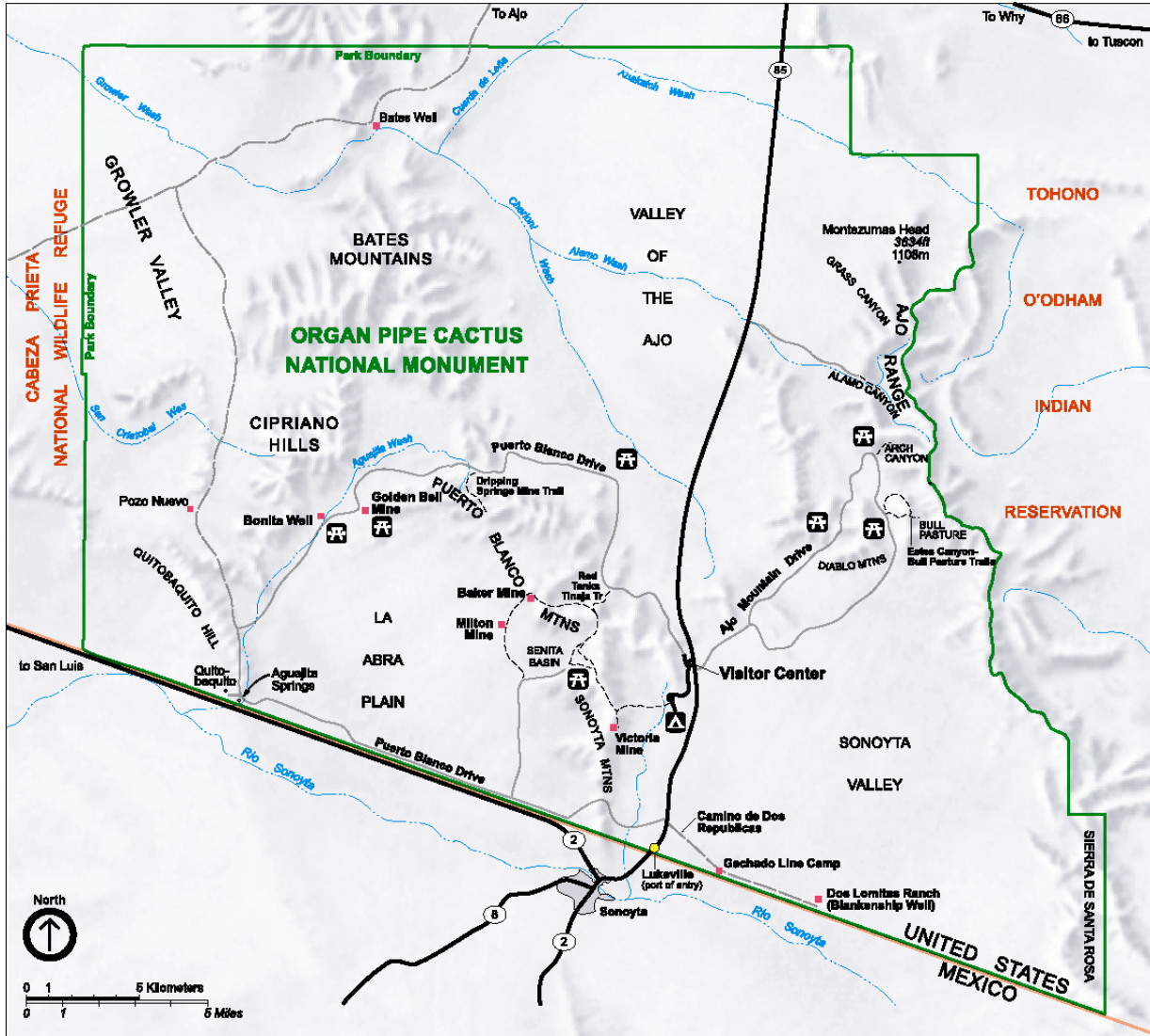
Since the late 1990s, both park units have become increasingly popular border crossing locations for drug smugglers and undocumented aliens. The U.S. Border Patrol (USBP) estimates that 500 people per day (180,000 per year) and 700,000 pounds of drugs entered the United States illegally through Organ Pipe Cactus National Monument in 2000 (NPS 2002c). Approximately 75,000 to 100,000 pounds of drugs and 55,000 undocumented immigrants enter through Coronado National Memorial each year (NPS 2003e).

Between 1991 and 2001 park rangers at Organ Pipe Cactus were involved in the seizure of over 48,000 pounds of marijuana. In 2001 drug traffic in the monument produced 27 drug cases, with seizures of over 13,000 pounds of marijuana, a 37% increase over 2000 levels. These activities have resulted in substantial degradation of the pristine desert landscape, as well as significant threats to public and employee safety from fleeing drug smugglers (NPS 2002c).

Vehicle pursuit by law enforcement personnel is a routine occurrence at Organ Pipe Cactus National Monument and is the single most dangerous activity along the border at this time (NPS 2003b). Kris Eggle, a 27-year-old NPS law enforcement ranger at Organ Pipe Cactus, was shot and killed in the line of duty on August 9, 2002, while pursuing drug smugglers fleeing from Mexican authorities just north of the border. The individuals crossed the border by vehicle and then abandoned the vehicle (NPS 2002c).

Illegal vehicular transport of drugs and people into the United States has created over 50 miles of illegal roads through the monument's designated wilderness areas in the past 24 months. Of particular concern are impacts to endangered species. At Organ Pipe Cactus, the ferruginous pygmy owl and the Sonoran pronghorn are especially sensitive to human presence (NPS 2003b). At Coronado, illegal vehicular activity has destroyed and damaged agave plants, the primary food resource of the endangered lesser long-nosed bat (NPS 2003e).

Figure 1: Organ Pipe Cactus National Monument



LEGEND

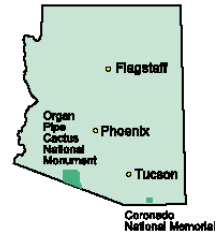
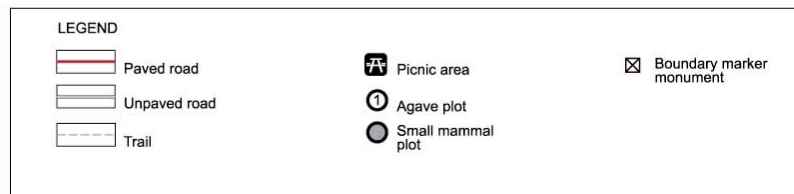
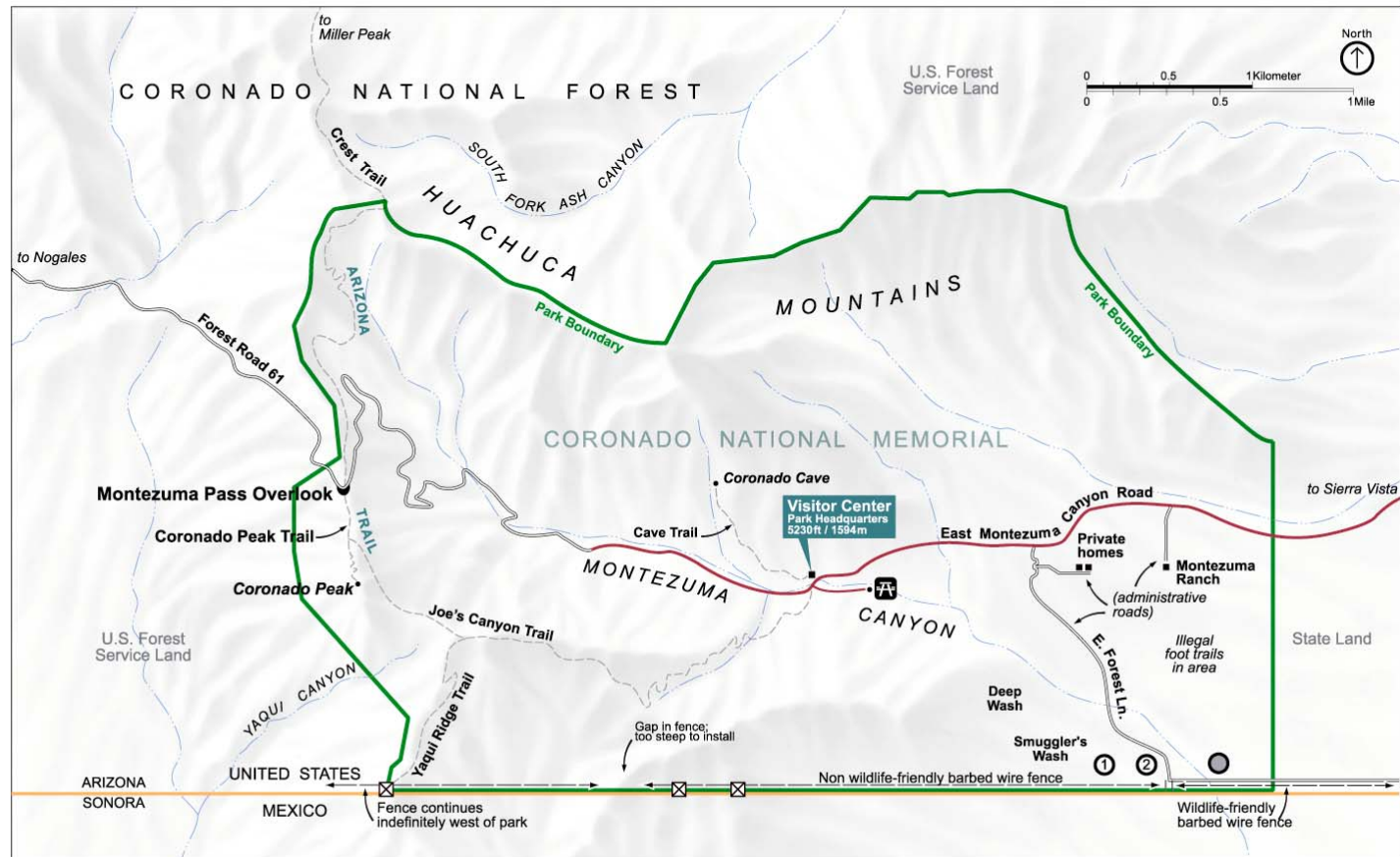


Figure 2: Coronado National Memorial



PURPOSE

The purpose of taking action is to evaluate a range of alternatives and strategies to ensure the protection of park resources and values by preventing illegal vehicular traffic from Mexico in Organ Pipe Cactus National Monument and Coronado National Memorial. The National Park Service (NPS) is proposing to construct a 30-mile vehicle barrier adjacent to the international border within Organ Pipe Cactus National Monument, and a 1-mile section in Coronado National Memorial. The purposes of this barrier are (1) to protect the fragile desert environments at both park units from adverse effects caused by illegal drug smuggling by vehicle across the international border, and (2) to protect the health and safety of visitors and federal employees.

NEED

A vehicle barrier is needed to prevent off-road access into the park units by drug smugglers, who represent the most serious threat to public and employee safety at these park units. As security is tightened at major ports of entry, airports, and urban areas, remote areas like these park units are becoming increasingly attractive to smugglers, terrorists, and others seeking illegal entry (NPS 2002c).

The flow of undocumented aliens and drug smugglers has had substantial impacts on the landscape of these two park units. If these impacts are not halted, most park resources at Organ Pipe Cactus will continue to be severely degraded. Some resources, such as endangered species, cannot be replaced once they are gone. Of particular concern are impacts to threatened or endangered species, such as the cactus ferruginous pygmy-owl and the lesser long-nosed bat. The Sonoran pronghorn, an endangered mammal, occurs at the national monument, and approximately 22–33 individuals remain in the United States. The habitat requirements of the cactus ferruginous pygmy-owl and the Sonoran pronghorn make them especially sensitive to human presence.

Apprehending drug traffickers at Organ Pipe Cactus often requires high-speed chases that present a threat to public health and safety. In 2001 rangers used tire spikes over a dozen times to prevent smugglers traveling through the monument at high speeds from returning to Mexico (NPS 2002c).

Illegal border activity at Organ Pipe Cactus has resulted in the creation of approximately 150 miles of illegal roads. Efforts to close roads with concrete barriers have been ineffective. Deep trenching along roadsides has been somewhat more effective in discouraging the creation of new roads in the monument's backcountry, much of which is designated wilderness. However, smugglers find alternatives, such as temporary bridges made of boards, to transport vehicles across the trenches. In recent years, visitors have been subject to numerous threats, robberies, and accidents involving illegal cross-border traffic at Organ Pipe Cactus National Monument. The number of abandoned vehicles left in the monument rose from nearly 0 in 1997 to over 50 in 1998 and to almost 150 in 2001 (NPS 2002c).

The monument's 30-mile border with Mexico is currently marked by a barbed wire fence that does little to control the flow of illegal vehicle traffic into the monument (NPS 2002c). Coronado's border is also marked by an ineffective barbed wire fence, the majority of which is not conducive for wildlife crossings (B. Alberti, pers. comm., P. Steinholtz, URS, Dec. 10, 2002).

A vehicle barrier would reduce the amount of illegal vehicle traffic and the creation of illegal roads, which have increased by 130 miles in the last 2 years at Organ Pipe Cactus. Much of the monument's

wilderness, which encompasses about 94% of its land, has already been adversely affected by illegal activity, including litter, illegal trails and roads, graffiti, and human waste (NPS 2002c).

Continued drug and people smuggling (and the high-speed chases that accompany such activities at the monument) produces the ongoing potential for injury or death to employees and the public (NPS 2002c).

DIRECTION / BACKGROUND

Several documents, legislative acts, and policies provide guidance to ensure that this plan satisfies the purpose and meets the needs defined above.

The National Environmental Policy Act requires federal agencies to consider alternatives and to analyze the impacts of those alternatives. The act is implemented through regulations of the Council on Environmental Quality (CEQ) (40 CFR 1500–1508). The National Park Service has in turn adopted procedures to comply with the act and the CEQ regulations, as found in *Director’s Order #12: Conservation Planning, Environmental Impact Analysis, and Decision-making* (NPS 2001c), and its accompanying handbook.

Impacts of the alternatives considered in this document were assessed in accordance with *Director’s Order #12*. The *Director’s Order #12 Handbook* requires that impacts on park resources be analyzed in terms of their context, duration, and intensity. In order to help the public and decision-makers understand the implications of impacts, they are described in terms of how long they would last, in conjunction with other impacts (cumulative impacts), and within context, based on an understanding and interpretation by resource professionals and specialists.

NATIONAL PARK SERVICE MANDATES AND POLICIES

Organic Act

The NPS Organic Act of 1916 directs the U.S. Department of the Interior and the National Park Service to manage units of the national park system “to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations” (16 USC 1). The Redwood National Park Expansion Act of 1978 reiterates this mandate by stating that the National Park Service must conduct its actions in a manner that will ensure no “derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress” (16 USC 1 a-1).

Management Policies

The NPS *Management Policies 2001* provide further interpretation and policy guidance relative to laws, proclamations, executive orders, regulations, and special directives. Some of the management policies that provide direction to this environmental assessment are discussed below.

Natural Resource Management. The National Park Service will preserve the natural resources, processes, systems, and values of units of the national park system in an unimpaired condition, to perpetuate their inherent integrity and to provide present and future generations with the opportunity to enjoy them (NPS 2001b, sec. 4).

Cultural Resource Management. The National Park Service will preserve and foster appreciation of the cultural resources in its custody, and it will demonstrate its respect for the people traditionally associated with those resources, through appropriate programs of research, planning, and stewardship (NPS 2001b, sec. 5).

Wilderness Preservation and Management. The National Park Service will manage wilderness areas for the use and enjoyment of the American people in such a manner as will leave them unimpaired for future use and enjoyment as wilderness. Management will include the protection of these areas, the preservation of their wilderness character, and the gathering and dissemination of information regarding their use and enjoyment as wilderness (NPS 2001b, sec. 6.1).

The National Park Service will encourage and facilitate those uses of wilderness that are in keeping with the definitions and purposes of wilderness and do not degrade wilderness resources and character. Appropriate restrictions may be imposed on any authorized activity in the interest of preserving wilderness character and resources or to ensure public safety (NPS 2001b, sec. 6.4).

Visitor Use. Unless mandated by statute, the National Park Service will not allow visitors to conduct activities that:

- would impair park resources or values
- create an unsafe or unhealthful environment for other visitors or employees
- are contrary to the purposes for which the park was established
- unreasonably interfere with:
 - the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park
 - NPS interpretive, visitor service, administrative, or other activities
 - NPS concessioner or contractor operations or services
 - other existing, appropriate park uses (NPS 2001b sec. 8.2)

Visitor Safety. While recognizing that there are limitations on its capability to totally eliminate all hazards, the National Park Service and its concessioners, contractors, and cooperators will seek to provide a safe and healthful environment for visitors and employees. The service will work cooperatively with other federal, tribal, state, and local agencies, organizations, and individuals to carry out this responsibility. The service will strive to identify recognizable threats to the safety and health of persons and to the protection of property by applying nationally accepted codes, standards, engineering principles, and other NPS policies. When practicable, and consistent with congressionally designated purposes and mandates, the service will reduce or remove known hazards and apply other appropriate measures, including closures, guarding, signing, or other forms of education. In doing so, the Service's preferred actions will be those that have the least impact on park resources and values (NPS 2001b, sec. 8.2.5.1).

Law Enforcement Program. The objectives of the NPS law enforcement program are (1) the prevention of criminal activities through resource education, public safety efforts, and deterrence; and (2) the detection and investigation of criminal activity and the apprehension and successful prosecution of criminal violators. In carrying out the law enforcement program, the Park Service will make reasonable efforts to provide for the protection, safety, and security of park visitors, employees, concessioners, and public and private property, and to protect the natural and cultural resources entrusted to its care (NPS 2001b, sec. 8.3.1).

Human Health and Safety. The saving of human life will take precedence over all other management actions. The National Park Service will seek to provide a safe and healthful environment for visitors and employees. The Park Service will strive to identify recognizable threats to the safety and health of persons and to the protection of property. Where practicable and not detrimental to NPS mandates to preserve park resources, known hazards will be reduced or removed. Where it would be inconsistent with congressionally designated purposes and mandates or where otherwise not practicable to make physical changes, efforts will be made to provide for personal safety and health through other controls, including closures, guarding, signing, or other forms of education. The Park Service recognizes that the environment being preserved is a visitor attraction but that it also may be potentially hazardous (NPS 2001b, 8:5–6).

General Management Plans

A park's general management plan provides a vision and policy guidance for the preservation of park resources, visitor use and experience, the types and general intensities of development, visitor carrying capacities, and opportunities to address management issues internal and external to the park. It also identifies connections among the various park programs and provides a policy framework for more site-specific planning.

Organ Pipe Cactus National Monument

The Organ Pipe Cactus *General Management Plan* was completed in 1997 and lists the following issues facing the monument:

- Burglary, theft, and vandalism occur randomly throughout the park and regularly during certain times of the year at the Quitobaquito Springs area. Although signs have been posted to warn visitors, this threat of criminal activity greatly affects the quality of visitor experiences in the area.
- Other pressing concerns include the adequate protection of threatened, endangered, and rare plant and animal species and communities, the monitoring of ecosystem health, and the revegetation of impacted sites.
- Several issues that affect the park are common to other places that lie along the international border with Mexico. Resource depletion, poor environmental standards and compliance, illegal drug traffic, illegal immigrant traffic, burglary, theft, and vandalism occur regularly in the park, together with resource depletion and the effects of population increases.

Coronado National Memorial

Coronado's *Draft General Management Plan / Environmental Impact Statement* was released in September 2002 and lists the following issues facing the memorial:

- Due to the location of the memorial on the U.S.-Mexican border, illegal trafficking in drugs and people adversely affects both resources and visitor experiences.
- The memorial contains superlative views of the San Pedro River Valley in the United States and Mexico, and these views represent an important part of the visitor experience. To carry out the memorial's purpose, the surrounding cultural landscape is important.

One of the goals common to all action alternatives defined in the *Draft General Management Plan* is to "eliminate cross-border illegal activities and provide a sufficient law enforcement presence to deter such activities." The plan also states that "the memorial would continue to seek equipment necessary to accomplish this task."

Purpose and Significance of the Park Units

Congress establishes national park system units to fulfill specified purposes, based on a park's unique and significant resources. All proposed projects must be consistent with a park's purpose, thereby conserving resources while providing for the enjoyment of future generations.

Organ Pipe Cactus National Monument

Park Purpose. The following statements describe the purpose and objectives for Organ Pipe Cactus National Monument:

- Perpetuate for future generations a representative sample of the natural and cultural resources and processes of the Sonoran Desert and provide for public understanding, use, and enjoyment.
- Preserve for future use and enjoyment the character and values of the designated wilderness within the monument under the Wilderness Act.
- Serve as a natural outdoor laboratory for understanding and managing Sonoran Desert ecosystems.
- Serve as a baseline indicator against which environmental changes can be identified.
- Establish a mutually agreeable relationship with the Tohono O'odham Nation to ensure perpetuation of their participation in and with the monument, and to preserve and continue their important relationship with this ecosystem.

Park Significance. Organ Pipe Cactus National Monument is significant in a number of different ways and to a number of different groups. The following statements describe aspects of the monument that make it significant to the nation and to the world.

- Organ Pipe Cactus National Monument is a globally significant Sonoran Desert ecosystem that has been continuously researched for over 50 years and has been designated a biosphere reserve under the International Man and the Biosphere program.
- It is the most biologically diverse protected area in the Sonoran Desert occurring within the United States.
- Organ Pipe Cactus National Monument has a protected ecosystem providing habitat for a highly diverse flora and fauna, including threatened, endangered, and sensitive plant and animal species.
- People who visit Organ Pipe Cactus National Monument experience a protected natural area with wilderness character that provides opportunities for solitude and primitive recreation, enjoying the nighttime sky, and spiritual replenishment in a Sonoran Desert setting.
- There are expansive vistas of Sonoran Desert landscapes, including such elements as dramatic mountains and valleys, eroding bajadas or slopes and alluvial fans, and magnificent specimens of columnar cacti.
- Organ Pipe Cactus National Monument is the site of cultural resources that reflect long, widespread, and diverse occupations by American Indian, Mexican, and Anglo groups.
- Organ Pipe Cactus National Monument is the site of the intersection of three cultures within the monument that is significant archeologically, geographically, and internationally.

Coronado National Memorial

Park Purpose. The purpose of Coronado National Memorial is to permanently commemorate the explorations of Francisco Vázquez de Coronado and to preserve and protect the cultural and natural resources within the memorial for public benefit and enjoyment.

Park Significance. Coronado National Memorial is significant for the following reasons:

- Coronado National Memorial is the only unit in the national park system that commemorates the Francisco Vázquez de Coronado expedition of 1540 to 1542. When reporting to Congress in 1940 on the establishment of the memorial, the Committee on Public Lands and Surveys said,

Coronado’s expedition was one of the outstanding achievements of a period marked by notable explorations. His expedition made known the vast extent and the nature of the country that lay north of central Mexico, and from the time of Coronado, Spaniards never lost interest in the country. In no small measure their subsequent occupation of it was due to the curiosity so created.
- The creation of the memorial was not to protect any tangible artifacts related to the expedition. It was created to give visitors an opportunity to reflect upon the impact the Coronado Entrada had in shaping the history, culture, and environment of the southwestern United States and its lasting ties to Mexico and Spain.
- The location was chosen for the panoramic views of the U.S.-Mexican border and the San Pedro River Valley, the route believed to have been taken by Coronado. It was hoped that this proximity to the border would strengthen binational amity and the bonds, both geographical and cultural, that continue to link the two countries.
- The memorial, near the center of the Sky Island bioregion (the juncture of four major biogeographic provinces — Madrean, Sonoran, Chihuahuan, and Southern Rockies / Mogollon), preserves a rich biological and geological diversity. Visitors are able to enjoy recreational opportunities that foster a better understanding and appreciation of the area’s natural and human history.

LEGISLATION AND EXECUTIVE ORDERS PERTINENT TO THE PROJECT

Various legislative acts or executive orders apply to one or both park units and have a bearing on this document.

- *Presidential Proclamation of May 27, 1907* — reserves a 60-foot-wide strip of land running parallel to the international boundary for patrol and protection purposes and applies to both Organ Pipe Cactus National Monument and Coronado National Memorial; it is used by the United States Border Patrol.
- *Executive Order No. 5462 of 1930* — established an 8.18-acre Customs and Immigration Reserve in Arizona for use by Customs and Immigration in the area of Organ Pipe Cactus National Monument.
- *Public Law 95-625* — designated more than 94% of the national monument as Organ Pipe Cactus Wilderness. Approximately 312,600 acres are designated wilderness and an additional 1,240 acres as potential wilderness (two sections of Arizona state trust lands, 640 acres each, near Bates Well and Dos Lomitas); the potential wilderness areas are managed to preserve wilderness values under a cooperative arrangement between the Park Service and the state.

INTERRELATIONSHIP WITH OTHER AGENCIES AND PROGRAMS

U.S. BORDER PATROL

The Immigration and Naturalization Service (INS), which became part of U.S. Department of Homeland Security on March 1, 2003, has the responsibility to regulate and control immigration into the United States. The function of the U.S. Border Patrol is to apprehend or remove undocumented aliens who enter or remain illegally in the United States. USBP activities are administered under the Bureau of Customs and Border Protection. The mission of the Border Patrol is to protect the U.S. boundaries through the detection and prevention of smuggling and illegal entry of undocumented aliens into the United States. Over 90% of USBP operations and activities occur within 50 miles of the border. With the increase in illegal drug trafficking, the Border Patrol has also assumed the major federal responsibility for illegal drug interdiction (INS 2002).

In partial response to the continued problems of smugglers and undocumented aliens, Congress passed the Illegal Immigration Reform and Immigrant Responsibility Act of 1996. This act authorizes the installation of additional physical barriers, roads, and other infrastructure deemed necessary in the vicinity of the U.S. border to deter illegal crossings in areas of high entry into the United States (Title 1, Subtitle A, sec. 102; INS 2002).

The National Drug Control Strategy, which was adopted by Congress to deal with rising rates of violent crime, serious damage to the nation's health and economy, and strains on vital relationships with international allies, mandates a "prevention through deterrence" strategy. The strategy also formulates a multi-year approach that requires the Border Patrol and other local drug law enforcement agencies to "gain, maintain, and extend control" of the border region into the United States (INS 2002).

In October 2002 the U.S. Border Patrol issued a *Draft Programmatic Environmental Impact Statement for U.S. Border Patrol Activities within the Border Areas of the Tucson and Yuma Sectors, Arizona* (INS 2002). The purpose of the statement is to "facilitate USBP law enforcement along the identified section of the U.S.-Mexico border" (INS 2002). The preferred alternative contains actions that would affect both Organ Pipe Cactus National Monument and Coronado National Memorial, as described below.

Organ Pipe Cactus National Monument — Activities listed in the statement that could affect Organ Pipe Cactus include the following (INS 2002):

- Construct a vehicle barrier in Organ Pipe Cactus National Monument.
- Install a pedestrian barrier (called a "landing mat fence") from the port of entry extending 1 mile east and west, where flat sheets of metal are attached to vertical posts that are usually 10 to 15 feet high. This is a long-range plan that the Border Patrol would like to implement over the next five years. The Border Patrol may want to increase the length of this barrier to 2 miles on each side (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002).
- Replace the existing temporary checkpoint facility on Arizona Highway 85. The new facility could be within the monument or north of the park on BLM land and would include pull-outs and possibly lighting to increase safety (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002).
- Install 12-foot-square concrete pads for the placement of mobile LORIScopes, which are portable skywatch towers with cabs that extend 25–30 feet high and act as a deterrent to illegal entry. The cab is equipped with a night vision scope, and a USBP agent can monitor

the area from inside. No locations have been identified, and no LORIScopes currently exist in the monument. The Border Patrol would place LORIScopes within the 60-foot easement that parallels the international boundary. Should the Border Patrol decide to place a LORIScope outside of the 60-foot easement but within the park, the plan would first be discussed with the National Park Service (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002).

- Replace the existing border road that parallels the international boundary within the 60-foot easement with an all-weather road, including bridges, culverts, and small pipes for drainage (if necessary). The Border Patrol acknowledges that 60 feet is not always wide enough for construction, and would seek authorization from landowners to go beyond that. No schedule has been defined for this activity at Organ Pipe Cactus, and an environmental assessment would be required (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002).

Coronado National Memorial — Activities that could affect Coronado National Memorial include the following (INS 2002):

- Install a camera tower at Montezuma Ranch, similar to a LORIScope but permanent and monitored in Naco. The camera would be located approximately 0.5 mile from the border (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002). The National Park Service is participating as a cooperating agency in the environmental assessment for this remote camera. Other agencies involved include the Immigration and Naturalization Service and the U.S. Department of Justice (NPS 2002d). The final environmental assessment and an anticipated finding of no significant impact are scheduled to be completed in the spring of 2003, with installation of the camera by July 2003. The original plan specified an 80-foot tower; the National Park Service has asked for a 60-foot tower instead (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002).
- Install an all-weather road (see Organ Pipe Cactus above). USBP employees do not currently patrol the park on a regularly scheduled basis (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002).

Of the proposed actions in the *Draft Environmental Impact Statement*, the pedestrian fence proposed at Organ Pipe Cactus is the most feasible (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002). The vehicle barrier proposed in this environmental assessment would not deter illegal pedestrian traffic from entering either park unit. Should a vehicle barrier be installed at Organ Pipe Cactus, the Border Patrol could decide to add landing mat material (flat sheets of metal) to the barrier to control pedestrian traffic, rather than install an additional pedestrian fence alongside the vehicle barrier (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002).

JOINT TASK FORCE SIX

Joint Task Force Six (JTF-6) was activated on November 13, 1989, at Fort Bliss, Texas, in order to provide assistance and support to counter drug agencies. The task force, which is under the authority of the Secretary of Defense in accordance with the President's National Drug Control Strategy, synchronizes and integrates Department of Defense operational, engineering, technological, training, and intelligence to drug law enforcement agencies to reduce the availability of illegal drugs in the United States (INS 1999).

The Immigration and Naturalization Service often requests JTF-6 assistance in daily operations to deter and detect illegal trafficking, as well as to process aliens once apprehension is made; the service also requests assistance in the design, construction, or upgrade of facilities. Assistance can include constructing patrol roads, fences, vehicle barriers, ditches, bridges, surveillance system towers, and

small checkpoint stations. JTF-6 has a supporting role, rather than a lead role, to the U.S. Border Patrol and provides that support only upon request (INS 1999).

In 1994 the Immigration and Naturalization Service and Joint Task Force Six prepared a *Programmatic Environmental Impact Statement*. The document considers full JTF-6 operations, engineering, and general support to the Immigration and Naturalization Service in accomplishing its mission to control the southwestern U.S.-Mexico border.

In 1999 the Immigration and Naturalization Service and Joint Task Force Six completed five technical support documents to define the baseline environmental conditions along the U.S.-Mexico border, with volume 4 focusing on Arizona (INS 1999).

In June 2001 the Immigration and Naturalization Service, in cooperation with Joint Task Force Six, published a *Final Report: Supplemental Programmatic Environmental Impact Statement for INS and JTF-6 Activities* (INS 2001). This document considers full JTF-6 support in implementing the INS strategy for enforcement activities within a 50-mile wide corridor along the U.S.-Mexico border, including both Organ Pipe Cactus National Monument and Coronado National Memorial. The engineering and construction activities expected to occur over the next five years would include constructing 9 miles of vehicle barrier in Arizona. The majority of the engineering activities proposed would involve constructing or upgrading roads and primary fences, most of these activities are planned in Texas. No proposed actions specifically address individual park units. However, because portions of some INS and JTF-6 actions have been located within National Parks along the U.S./Mexico border, JTF-6 is serving as a cooperating agency on this NPS environmental assessment because of their special expertise (INS 2001).

The actions considered in this environmental assessment in regard to materials and methods involved in constructing a vehicle barrier would be consistent with those outlined in the *JTF-6 Programmatic Environmental Impact Statement*.

INTERNATIONAL BOUNDARY AND WATER COMMISSION, UNITED STATES AND MEXICO

The mission of the International Boundary and Water Commission (IBWC) is to apply the rights and obligations that the governments of the United States and Mexico assume under the numerous boundary and water treaties and related agreements, and to do so in a way that benefits the social and economic welfare of people on both sides of the boundary and improves relations between the two countries (IBWC 2003b).

Wherever treaty provisions call for joint action or joint agreement by the two governments, such matters are handled by or through the U.S. Department of State and the Mexican Secretariat of Foreign Relations (IBWC 2003b).

The U.S.-Mexico land boundary extends for 674 miles and is marked on the ground by 276 permanent monuments. The monuments are maintained jointly by the commission under a 1944 Water Treaty, which extended the commission's jurisdiction to the land boundary between the two countries (IBWC 2003b).

BORDER XXI AND BORDER 2012 PROGRAMS

The Border XXI program was initiated in 1996 with a five-year plan for addressing the most challenging environmental and human health problems in the region. This program ended in 2002, and the proposed Border 2012 program is the latest multi-year, binational effort to protect public health and the environment in the U.S.-Mexico border region, consistent with the principles of

sustainable development. The U.S. Environmental Protection Agency (EPA), the U.S. Department of Health and Human Services, Secretaría de Medio Ambiente y Recursos Naturales (Mexico's Secretariat of Environment and Natural Resources), Secretaría de Salud (Mexico's Secretariat of Health), the U.S. border tribes, and the environmental agencies from each of the 10 U.S.-Mexico border states have developed the Border 2012 program (US EPA 2003).

The formal foundation for these efforts is the La Paz Agreement, which establishes cooperation between Mexico and the United States for the protection, improvement, and conservation of the environment in the border area. The agreement is implemented through multi-year binational programs, such as the new Border 2012 program (US EPA 2003).

The Border 2012 program proposes four regional workgroups, including an Arizona-Sonora workgroup, to deal with specific environmental issues affecting subregions (USEPA 2003). In 1997 Border XXI identified a Sonora/Arizona region to conduct Sonoran desert cooperative resource management, particularly binational field studies at Organ Pipe Cactus National Monument, Pinacate Biosphere Reserve, and Cabeza Prieta National Wildlife Refuge (Border XXI 1997).

PLANNING CONSIDERATIONS

TOHONO O'ODHAM NATION

Organ Pipe Cactus National Monument is bordered on the east by the Tohono O'odham Nation, which is comprised of the Hia-Ced O'odham and the Tohono O'odham, with a total population of 11,000 (Wheeler 2003). Members of both groups also live among several municipalities in the United States and Mexico. The reservation complex consists of one large and two smaller reservations, totaling 2,855,894 acres and comprising 11 political districts (NPS 1995). One town, Sells (population 2,800) exists within the reservation, along with small and widely scattered villages (Wheeler 2003). Each district is self-governing on local matters, much like individual U.S. states (NPS 1995).

An all-Indian Customs unit, called the Shadow Wolves, patrols the 76 miles of border that the reservation shares with Mexico and focuses on intercepting and apprehending drug smugglers (Wheeler 2003). The unit includes 21 agents and has recently become part of the Department of Homeland Security.

INTERNATIONAL BIOSPHERE RESERVE PROGRAM

Biosphere reserves are sites that are part of a worldwide network of natural reserves recognized for their roles in (1) conserving genetic resources; (2) facilitating long-term research and monitoring; and (3) encouraging education, training, and the demonstration of sustainable resource use. A biosphere reserve is usually representative of a biogeographic province (NSP 2001b).

The Sonoran Desert biogeographic region covers approximately 76.4 million acres in southern Arizona and northern Mexico, and it is among the world's most biologically diverse deserts. Organ Pipe Cactus National Monument, near the center of the region, protects only a small portion (330,689 acres) of this vast area (NPS 1995).

In 1976 Organ Pipe Cactus National Monument was designated a United States Biosphere Reserve as part of UNESCO's Man and the Biosphere Program. This designation distinguishes the park as an outstanding, internationally significant ecosystem. Increasing attention to the park's resources from internationally and nationally recognized scientists and researchers underscores the importance of the park's natural resources (NPS 1995). However, designation of park lands as a biosphere reserve

does not alter the purposes for which the park was established, change management requirements, or reduce NPS jurisdiction over park lands (NPS 2001b).

Many of the monument's long-term resource inventory and monitoring projects were initiated as part of the Ecological Monitoring Program (formerly the Sensitive Ecosystems Program) and are oriented to the Man and the Biosphere program, particularly those dealing with adjacent land use trends in Sonora (NPS 1995).

The vision and goals related to a Sonoran Desert Biosphere Reserve, as stated in the monument's final *General Management Plan* (NPS 1997a), are as follows:

- Facilitate a voluntary and cooperative effort with neighboring land managers to preserve, study, and wisely use the natural and cultural resources within an expanded Sonoran Desert Biosphere Region.
- Work toward balanced, zoned management of natural and cultural resources across the international and other borders through voluntary cooperation and the sharing of knowledge, expertise, and personnel among Sonoran Desert land managers.
- Offer visitors a wide range of opportunities for self-directed experiences related to natural and cultural resources, with international information that would be global in perspective and would emphasize human/environmental concepts and concerns. The Sonoran Desert would constitute an expanded biosphere reserve.

The geographic extent of a future Sonoran Desert biosphere reserve region is currently being discussed within the Arizona-Sonora transborder area by the International Sonoran Desert Alliance (ISDA). The alliance represents the indigenous and non-indigenous populations of the United States and Mexico in promoting conservation and sustainable and environmental education (NPS 1995, ISDA 2003). Sites that could be part of a Sonoran Desert biosphere reserve include adjacent lands around the Organ Pipe Cactus Biosphere Reserve and other areas of ecological importance, such as El Pinacate Y el Gran Desierto de Altar (the Pinacate and Great Desert) Biosphere Reserve in northern Sonora, Mexico (NPS 1995).

SONORAN PRONGHORN

The Sonoran pronghorn, one of five subspecies of the American pronghorn, is an endangered species that occurs in Sonoran desert habitats, primarily on federally managed lands in southwestern Arizona (including Organ Pipe Cactus National Monument, but not Coronado National Memorial), and in northern Sonora, Mexico. Current estimates indicate that 22–33 pronghorn exist in the United States (NPS 2003c). The *Final Supplemental Environmental Impact Statement Re-Analysis of Cumulative Impacts on the Sonoran Pronghorn for Organ Pipe Cactus* states that factors threatening the continued survival of the pronghorn include physical manmade barriers to historical habitat, illegal hunting, and human encroachment (NPS 2001a).

In Arizona, Sonoran pronghorn habitat occurs only on federal lands. Although agency lands are contiguous, each agency has a specific mission that presents varying management practices to meet agency goals. The Sonoran pronghorn range is divided into two, possibly three subpopulations, by a combination of busy roadways and fences. The U.S. population is separated from the Mexico population by Mexico Highway 2 and the International Boundary fence. The Mexican population is likely further subdivided by Highway 8. In the United States, Sonoran pronghorn rarely occur east of AZ 85, although suitable habitat does exist east of the highway (NPS 2001a).

Habitat loss may result in adverse impacts on the Sonoran pronghorn. While the primary threats to pronghorn are long-term climate change and the current short-term drought, examples of human-

induced actions that may result in loss or modification of habitat include permanent human developments, roads, trails, or other areas cleared of vegetation, invasion by nonnative plants, and modification of plant communities (NPS 2001a). Illicit cross-country driving and law enforcement efforts to control such activity has resulted in major, long-term adverse impacts from destruction of habitat and the restriction or modification of pronghorn movements (NPS 2001a). Fences are also barriers to movement, and probably confound movements within the area enclosed by the major roadways (NPS 2001a).

Causes of disturbance to Sonoran pronghorn likely include recreation, ground management activities, vehicles, aircraft, and movements of large numbers of illegal immigrants and smugglers. Law enforcement control of illicit immigrant and drug traffic decreases the amount of human presence in pronghorn habitat, resulting in beneficial, short- to long-term impacts of moderate to major intensity (NPS 2001a).

ADJACENT LANDS

Organ Pipe Cactus National Monument

As previously described, the Tohono O’odham Reservation borders Organ Pipe Cactus National Monument on the east (see page 13).

Cabeza Prieta National Wildlife Refuge. In 1939 Cabeza Prieta National Wildlife Refuge was established “for the conservation and development of natural wildlife resources.” Located west and north of Organ Pipe Cactus, the 860,000-acre refuge area contains rugged mountains and broad valleys with sand dunes and lava flows (Ajo, Arizona 1998). Although most of the refuge’s numerous mountains rise less than 3,000 feet above the valleys, they are extremely rugged and very arid (National Audubon Society 2003). Over 90% of Cabeza Prieta was designated by Congress as wilderness in the 1990 Arizona Wilderness Act. To help maintain wilderness character, no vehicular traffic is allowed except on designated public use roads (NPS 2001a).

Cabeza Prieta shares a 56-mile international border with Sonora, Mexico (Ajo, Arizona 1998). The border fence in the wilderness area is a multi-strand (4 to 5 wires) barbed wire fence that is not wildlife-friendly (in order to keep livestock out). Sections of the fence have been stolen and are missing. Staff at the refuge expect this to continue, resulting in large sections of fence being lost (R. DiRosa, NPS, pers. comm., P. Steinholtz, URS, Dec. 30, 2002).

The refuge has the lead for recovery of the endangered Sonoran pronghorn. A wide variety of flora and fauna also occur in the refuge, including saguaros, creosote, ironwood, ocotillo, bighorn sheep, Gila monsters, sidewinders, cactus wrens, Harris hawks, and the endangered lesser long-nosed bat. Archeological evidence of early human presence includes foot trails, petroglyphs, shells, and pottery. Part of the Camino del Diablo or “Devil’s Highway” passes through the refuge. This historic route to California was traveled by early missionaries, explorers, and prospectors and is open to four-wheel drive visitation (National Audubon Society 2003).

Mexico. The agricultural Sonoyta Valley and town of Sonoyta are south of Organ Pipe Cactus in Sonora, Mexico. Mexican Highway 2 parallels the southern boundary of the monument from its western boundary to roughly its intersection with Highway 85 at Sonoyta.

The El Pinacate Y el Gran Desierto del Altar (the Pinacate and Great Desert) includes 1,962,553 acres south and west of the monument within a biosphere reserve protective buffer area, a portion of which adjoins the southwestern boundary of the national monument (NPS 1995; The Nature Conservancy 2003a). This area contains the largest active dune fields in North America. Mexico

declared this area a biosphere reserve in 1993. The Instituto del Medio Ambiente y Desarrollo Sustentable del Estado de Sonora (IMADES) has management authority for El Pinacate.

El Pinacate is included in the Nature Conservancy's "Parks in Peril" program, which provides financial support and scientific expertise to protect and manage national parks in Latin American and Caribbean countries that do not have conservation resources (The Nature Conservancy 2003b). Staff collaborate with U.S. staff at Organ Pipe Cactus National Monument and Cabeza Prieta National Wildlife Refuge (The Nature Conservancy 2003a).

Coronado National Memorial

No Native American lands border Coronado National Memorial.

Coronado National Forest. Coronado National Forest borders the memorial to the west and north, and covers 1,780,000 acres in southeastern Arizona and southwestern New Mexico. Elevations range from 3,000 feet to 10,720 feet in 12 mountain ranges or "sky islands" that rise from the desert floor and support biologically diverse plant communities (USFS 2003). This area of the national forest includes the Huachuca Mountains, which forms the memorial's northern and western boundaries, with elevations from about 5,400 to 5,900 feet.

Mexico. No developed communities or infrastructures, such as highways or towns, exist immediately south of Coronado's international border.

Mexican officials are considering the establishment of a new protected area south of Coronado National Memorial, which would be called Area de Proteccion de Flora y Fauna Mavavi. The decree establishing this protected area is expected to be published in May 2003 (B. Alberti, NPS, pers. comm., P. Steinholtz, URS, Jan. 10, 2003).

State and Private Lands. A section of state land lies to the east of the memorial, and a dirt road enters the memorial from this parcel. The road is closed at the north end where it enters a paved road because this route was used often for vehicles smuggling drugs into the United States or escaping to Mexico. Because of this, the Border Patrol built a short section of vehicle barrier on private land east of the memorial's boundary (B. Alberti, NPS, pers. comm., P. Steinholtz, URS, Dec. 30, 2002). However, the barrier was not completed; the metal rails remain in place but many have not been cemented in the ground (B. Alberti, NPS, pers. comm., P. Steinholtz, URS, Dec. 10, 2002).

The remaining land surrounding the memorial north and south of the state land consists primarily of privately owned residential and agricultural lands, with a few commercial parcels (NPS 2002d).

OBJECTIVES IN TAKING ACTION

Objectives define what must be achieved to a large degree for the action to be considered a success (NPS 2001c). All alternatives selected for detailed analysis must meet all objectives to a large degree, as well as resolve the purpose of and need for action. The following objectives for managing illegal vehicular entry into Organ Pipe Cactus National Monument and Coronado National Memorial are grounded in each park unit's enabling legislation, purpose, significance, and mission goals. (The objectives apply to both Organ Pipe Cactus and Coronado, unless otherwise specified.)

FLOODPLAINS AND SOILS

- Protect soils and floodplains from disturbance and erosion caused by illegal vehicles and ensure the unobstructed flow of water through streambeds.

VEGETATION

- Protect vegetation from damage and destruction caused by illegal roads and cross-country driving.
- Minimize the amount of exotic vegetation that is introduced during construction activities.

WILDLIFE, INCLUDING THREATENED OR ENDANGERED SPECIES

- Protect wildlife and habitat from damage and destruction caused by the creation of illegal roads and cross-country driving; ensure the safe and unobstructed passage of wildlife through a wildlife-friendly vehicle barrier fence.
- Protect threatened or endangered species and critical habitat from disturbances caused by human presence and vehicular noise.

VISITOR EXPERIENCE, USE, AND APPRECIATION

- Prevent further impacts to park viewsapes and the creation of illegal cross-country roads.
- Improve visitor experience by restoring a more pristine environment.

HUMAN HEALTH AND SAFETY

- Enhance visitor and employee safety.

PARK MANAGEMENT AND OPERATIONS

- Reduce the need for a huge increase in law enforcement or maintenance staff or equipment.

ADJACENT LAND AGENCIES

- Work with adjacent land agencies to mitigate the effects of terminating a vehicle barrier at park boundaries, which could cause increased illegal vehicular traffic (and associated impacts) through adjacent lands.

ISSUES, CONCERNS, AND CONSTRAINTS

U.S. BORDER PATROL

The U.S. Border Patrol patrols the international boundary in both Organ Pipe Cactus National Monument and Coronado National Memorial using a road within the 60-foot-wide strip of land paralleling the international boundary, and also conducts fly-overs along the border. The Border Patrol has a physical presence 24 hours per day, seven days per week. Helicopters fly at elevations high enough to be seen in order to deter illegal entry. Helicopter operators try to avoid concentrations of Sonoran pronghorn, as well as fawning areas (INS 2002).

Organ Pipe Cactus National Monument. The number of USBP agents in the Yuma and Tucson sectors has more than tripled since FY 1996. Which roads are patrolled on a daily basis changes in response to illegal alien traffic patterns. Off-road operations conducted at the Ajo station (which includes Organ Pipe Cactus) include agents on foot and in four-wheel drive vehicles and all-terrain

vehicles (ATVs), which are used on BLM lands. Air operations are infrequent and depend on illegal travel routes; a helipad and refueling station are located at the USBP station. The Ajo station currently uses 184 sensors (small transmitters) on or near roads and trails used by illegal immigrants and vehicle traffic, particularly near the border. The sensors are serviced generally every four months by vehicle (INS 2002).

Coronado National Memorial. Off-road USBP activity in the Naco sector is limited to daily foot and horse patrols. Helicopter flights can occur on a daily basis, with no set flight paths; a helipad and small refueling facility are at the Naco station. Approximately 124 sensors, the majority of which are near the city of Naco, Arizona, are maintained or moved monthly (INS 2002).

NATIVE AMERICAN CONCERNS

The Tohono O’odham Reservation has problems with illegal pedestrian and vehicle traffic similar to those that the National Park Service has at Organ Pipe Cactus. A vehicle barrier in the national monument could increase illegal entries east of the park on reservation land. Increased security at Arizona’s designated border crossings — Nogales and Sasabe to the east and Lukeville (within Organ Pipe Cactus National Monument) to the west — has pushed smugglers, both on foot and in trucks, toward the remote and less guarded reservation in between. The Shadow Wolves patrol unit needs greater resources to combat the illegal drug smuggling through the reservation (Wheeler 2003).

The National Park Service would continue to work with the Tohono O’odham Nation to address any spillover effects that may result from terminating the vehicle barrier at the park’s southeastern boundary.

TRANSBOUNDARY IMPACTS

The Council on Environmental Quality (CEQ) issued guidance on July 1, 1997, to clarify the applicability of the National Environmental Policy Act (NEPA) to proposed federal actions in the United States that may have effects “extending across the border and affecting another country’s environment” (CEQ 1997). The law directs federal agencies to analyze the effects of proposed actions to the extent they are reasonably foreseeable consequences of the proposed action, regardless of where those impacts might occur. NEPA case law has reinforced the need to analyze impacts regardless of geographic boundaries within the United States.

The CEQ guidance also states

Agencies should be particularly alert to actions that may affect migratory species, air quality, watersheds, and other components of the natural ecosystem that cross borders, as well as to interrelated social and economic effects. Should such potential impacts be identified, agencies may rely on available professional sources of information and should contact agencies in the affected country with relevant expertise (CEQ 1997).

However, the courts have adopted a “rule of reason” to judge an agency’s actions in this respect, so agencies are not required to discuss “remote and highly speculative consequences” (CEQ 1997).

SCOPE OF THE ENVIRONMENTAL ASSESSMENT

ISSUES CONSIDERED

Issues associated with construction of a vehicle barrier at the park units were identified during scoping meetings with NPS staff and as a result of public comments. The issues listed in Table 1 are further discussed in the “Affected Environment” section, and impacts are analyzed in the “Environmental Consequences” section for each park unit. If no issues are expected based on available information, then the issue was eliminated from further discussion, as discussed below.

Table 1: Issues Associated with the Action

Issue	Organ Pipe	
	Cactus	Coronado
Floodplains		
Construction of a vehicle barrier could potentially alter the course of water flow or create erosion problems in streambeds and floodplains.	X	X
Soils		
Soil loss could occur due to the amount of dust generated by illegal cross-country driving.	X	X
Construction of a vehicle barrier could result in soil erosion and impacts such as compaction and trampling.	X	X
Vegetation		
Rare or unusual vegetation is damaged by illegal trampling and vehicular access in the backcountry.	X	
Vegetation that provides habitat for threatened, endangered, or special concern species could be damaged by illegal trampling and vehicular access in the backcountry.	X	X
Construction of a vehicle barrier could cause the introduction or promotion of nonnative species in the parks.	X	X
Wildlife and Wildlife Habitat		
Fish and wildlife could respond negatively to illegal human presence in the backcountry and to noise generated by illegal cross-country driving.	X	X
Habitat for fish and wildlife could be degraded due to the creation of illegal trails and roads throughout the backcountry.	X	X
Threatened, Endangered, and Special Concern Species		
Threatened or endangered species could respond negatively to illegal human presence in the backcountry and to noise generated by illegal cross-country driving. Species of particular concern include the Sonoran pronghorn and the cactus ferruginous pygmy-owl.	X	X
Habitat for threatened or endangered species could be degraded due to the creation of illegal trails and roads throughout the backcountry.	X	X
Visitor Use, Understanding, and Appreciation		
A vehicle barrier could affect the natural or historic views at the parks by limiting the view or disrupting the aesthetic qualities of the natural surroundings.	X	X
The pristine nature of the park units could continue to be compromised by trash, vehicles driving illegally through backcountry, and damage to natural resources.	X	X
Illegal driving through Organ Pipe Cactus could reduce the amount of natural quiet visitors expect to experience.	X	
Human Health and Safety		
The health and safety of park visitors and staff is threatened by drug smugglers and undocumented aliens, as evidenced by the death of a park ranger who was shot and killed at Organ Pipe Cactus while pursuing Mexican drug smugglers.	X	X
High-speed chases that occur at Organ Pipe Cactus could result in accidents or serious injury to park staff.	X	
Park law enforcement rangers should work in cooperation with USBP agents in the apprehension of drug smugglers in order to decrease risks to park visitors and employees.	X	X
Park Management and Operations		
Illegal smuggling-related activities in the park units have substantially increased every year since 1998. If these trends continue, park staff (particularly law enforcement) would also need to increase each year at the same rate.	X	X

Issue	Organ Pipe	
	Cactus	Coronado
Illegal vehicular activity requires additional park resources (staff and equipment) to apprehend criminals and restore damage to natural resources.	X	X
Park law enforcement rangers should work in cooperation with USBP agents in apprehending drug smugglers.	X	X
Adjacent Land Agencies		
Adjacent land agencies currently experience problems related to illegal smuggling across the international border, including damage to natural resources and risk to human health and safety, which could increase if the park units install a vehicle barrier that terminates at agency boundaries.	X	

ISSUES DISMISSED FROM FURTHER CONSIDERATION

The following issues were eliminated from further analysis for the reasons stated below.

Air Quality

Section 118 of the 1963 Clean Air Act (42 U.S.C. 7401 et seq.) requires a park unit to meet all federal, state, and local air pollution standards. 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. Both Organ Pipe Cactus National Monument and Coronado National Memorial have been designated a class II airshed in accordance with the Clean Air Act. NPS *Management Policies* (2001) direct parks to seek the best air quality possible in order to “preserve natural resources and systems; preserve cultural resources; and sustain visitor enjoyment, human health, and scenic vistas.”

A vehicle barrier as described in alternative B would not contribute impacts to air quality. Construction activities under a build alternative would generate a substantial amount of dust, particularly at Organ Pipe Cactus National Monument, and the lack of moisture results in powdery soil on the border road. To mitigate dust, a road maintenance plan would be prepared and adhered to during construction. Water and soil binder would be frequently applied to the road during construction, and soil binder could help reduce the amount of water required (W. Mikus, NPS, pers. comm., P. Steinholtz, URS, Dec. 11, 2002). Any impacts resulting from barrier maintenance activities under alternative B are expected to be short term and intermittent.

Because mitigating measures would be followed during construction under alternative B to reduce or eliminate any short-term impacts to air quality, no long-term impacts to air quality are anticipated. Therefore, air quality has been dismissed as an issue.

Soundscapes

In accordance with NPS *Management Policies* (2001) and *Director's Order #47: Sound Preservation and Noise Management*, an important part of the NPS mission is to preserve natural soundscapes associated with national park units. Under alternative B the existence of a vehicle barrier would not contribute impacts to soundscapes. Construction activities would generate temporary noise from the use of heavy equipment and possibly helicopters (which could be used to place material in wilderness areas). Any effects to soundscapes from barrier maintenance activities would be short term and intermittent.

Under alternative B, no long-term significant impacts to soundscapes are anticipated once construction is complete. Therefore, soundscapes as an issue has been dismissed.

Water Quality

NPS *Management Policies* require that water quality be protected consistent with the Clean Water Act. Section 404 of the Clean Water Act authorizes the U.S. Army Corps of Engineers to prohibit or regulate, through a permitting process, the discharge of dredged or fill material or excavation within U.S. waters.

Surface water resources at Organ Pipe Cactus National Monument are limited. Water availability varies seasonally, with the majority of rainfall occurring in late summer as geographically isolated thunderstorms or in winter as widespread, regional storms. These storms typically produce brief ephemeral flows that quickly infiltrate streambeds; only rarely is there sufficient runoff to cause flooding in the normally dry washes. All of the major watersheds within Organ Pipe Cactus National Monument flow in a westerly direction — either northwest to the Gila River, or southwest to the Gulf of California. No perennial (permanent) rivers or streams exist within the monument (NPS 1995). However, a thin alluvial aquifer under the La Abra Plain supplies the water for more than five natural springs and seeps in the Quitobaquito Hills region (Carruth 1996). All of these springs and the Aguajita aquifer are hydrologically linked (NPS 2003c).

Most surface waters in Coronado National Memorial are ephemeral streams, consisting of dry washes, arroyos, or continuous and discontinuous gullies. Most of these surface water features drain toward the southeast. Ephemeral streams are dry most of the time, with flow generally occurring only for a short time after extreme storms (NPS 2002d). Montezuma Canyon is the major drainage in the memorial. It receives flow from several ephemeral streams before its confluence with the San Pedro River. Evidence of streambank erosion and downcutting in Montezuma Canyon can be seen in areas where development and grazing have occurred. In addition, large amounts of eroded soils that have been transported downstream can be seen along drainageways (NPS 2002d).

A vehicle barrier as described under alternative B would not contribute impacts to water quality. Water could be used along the border roads in order to mitigate dust, but such use is not expected to impact water quality at either park unit. Therefore, there would be no impacts to water quality at Organ Pipe Cactus National Monument or Coronado National Memorial under any of the alternatives.

Wetlands

Executive Order 11990, “Protection of Wetlands,” requires federal agencies to avoid, where possible, adversely impacting wetlands. Proposed actions that have the potential to adversely impact wetlands must be addressed in a statement of findings.

Wetlands are rare within Organ Pipe Cactus National Monument. Those that do exist are limited to perennial water sources, such as the pond and springs at Quitobaquito and to a lesser extent springs, water developments, and tinajas. Quitobaquito is outside the impact area and would not be affected by any proposed construction. Aguajita Springs, which is approximately 100 feet north of the international boundary, conforms to at least one of the wetland criteria — that of the preponderance of hydrophytic vegetation — established under the definition of wetlands that have been adopted by the National Park Service (Rowlands 2003). However, this is a marginal wetland because no obligate wetland species and no hydrophytes (*sensu stricto*) were observed on and near the spring, and the spring does not have a substrate that is predominantly undrained hydric soil (Rowlands 2003). Mitigation has been planned to avoid impacts to wetlands at Aguajita (see page 31).

Wetlands in Coronado National Memorial are associated with a number of seeps and springs. None are within the project area, and there are no perennial streams within the memorial.

No impacts to wetlands are expected at Organ Pipe Cactus National Monument or Coronado National Memorial under any of the alternatives.

Wilderness

In accordance with NPS *Management Policies*, areas of potential wilderness are managed as if they were designated wilderness, and efforts are made to eliminate those conditions that preclude wilderness designation. Organ Pipe Cactus contains 312,000 acres of congressionally designated wilderness and an additional 2,400 acres of potential wilderness. Only one area in wilderness of approximately 2,600 square feet would be affected. A Normandy-style barrier would be placed here, which would be held in the ground by weight and require no digging (see the description of the alternative B on page 28).

No wilderness areas exist within Coronado National Memorial.

Cultural Resources

The National Historic Preservation Act, as amended in 1992 (16 USC 470 et seq.), and the National Environmental Policy Act, as well as the NPS *Cultural Resource Management Guideline* (NPS 1998), *Management Policies* (NPS 2001b), and *Director's Order-12, Conservation Planning, Environmental Impact Analysis and Decision-making* (NPS 2001c), require the consideration of impacts on cultural resources listed on or eligible for listing on the National Register of Historic Places. The actions described in this document are subject to section 106 of the National Historic Preservation Act, under the terms of the 1995 Servicewide Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation, and the National Conference of State Historic Preservation Officers. An assessment of effect was submitted to the Arizona state historic preservation officer for review and comment for the following cultural resources.

Archeological Resources

Organ Pipe Cactus National Monument. The Western Archeological and Conservation Center surveyed the project area for archeological resources during December 2002. Several sites containing artifact scatters were discovered in the project area. None of the sites would be either directly or indirectly impacted by the preferred alternative. However, to ensure that no impacts would occur to these resources, the following conditions are required:

1. If concealed archeological resources are encountered during project activities, all necessary steps will be taken to protect them and to notify the park consulting archeologist.
2. Where recorded cultural resources are adjacent to the existing fence line road, construction activities will not exceed the current width of the road.
3. Archeological sites in areas of possible impact due to road widening or construction will be flagged.
4. An archeologist will monitor all construction activities in the vicinity of the archeological sites to ensure that archeological sites are avoided.
5. An archeologist will monitor activities related to the construction of the Normandy barrier and the two access roads.

Provided that these conditions are met, the determination of no historic properties affected was made.

Coronado National Memorial. The Western Archeological and Conservation Center surveyed the project area for archeological resources during December 2002. No archeological resources were found in the project area; therefore, this topic was dismissed from further consideration.

Historic Structures and Buildings, and Cultural Landscapes

The National Historic Preservation Act, as amended (16 USC 470 et seq.); the National Environmental Policy Act of 1969 (42 USC 4321 et seq.); and NPS *Director's Order #28, Management Policies*, and *Director's Order #12* require the consideration of impacts on historic structures and buildings listed on or eligible for listing on the National Register of Historic Places.

According to the NPS *Cultural Resources Management Guideline* (NPS 1998), a cultural landscape is

a reflection of human adaptation and use of natural resources and is often expressed in the way land is organized and divided, patterns of settlement, land use, systems of circulation, and the types of structures that are built. The character of a cultural landscape is defined both by physical materials, such as roads, buildings, walls, and vegetation, and by use reflecting cultural values and traditions (NPS 1998).

Thus, cultural landscapes are the result of the long interaction between man and the land, the influence of human beliefs and actions over time on the natural landscape. Shaped through time by historical land-use and management practices, as well as by politics and property laws, levels of technology, and economic conditions, cultural landscapes provide a living record of an area's past, a visual chronicle of its history. The dynamic nature of modern human life, however, contributes to the continual reshaping of cultural landscapes; making them a good source of information about specific times and places, but at the same time rendering their long-term preservation a challenge.

Organ Pipe Cactus National Monument. Quitobaquito Springs is a cultural landscape that reflects a sequence of human occupations with a rich ethnic history of various groups interacting with natural features from prehistoric times to the present period. Quitobaquito retains the essential elements of its natural setting to which prehistoric Paleo-Indian, Archaic, and Hohokam groups and historic O'odham, Hohokam groups and historic O'odham, Spanish, Mexican, and Anglo groups adapted. Prehistoric and historic sites of habitation and occupation, historic irrigation, as well as two main springs, a human-made pond, and sites of a fig and pomegranate orchard and adjacent cornfield exist today. Quitobaquito Springs was formally determined eligible for listing on the National Register of Historic Places on August 18, 1994.

The Dos Lomitas Ranch is an adobe ranch house near the project area that is regarded as a rare example of a Sonoran, Mexican-built ranch house that exhibits an earlier style than its 1920s construction. The ranch house, the outbuilding, two ruins of buildings, and a mesquite railroad tie corral comprise the historic fabric. The ranch was listed on the National Register of Historic Places on May 6, 1994. The historic structures have been vandalized, with wood having been removed from the corral and other structures. The National Park Service will place temporary construction fencing around the ranch during the period of proposed construction to minimize any effect on the cultural resources. Dos Lomitas Ranch was listed on the National Register of Historic Structures on May 6, 1994, as both a historic structure and a cultural landscape.

The Gachado Well and Line Camp was among the first efforts to raise cattle in what is now the national monument. The property contains an adobe house in the Sonoran tradition of architecture and a corral of mesquite and paloverde, characteristic of the frontier practice of making do with what was available. The Gachado Well and Line Camp were listed on the National Register of Historic Places on November 2, 1978, as both a historic structure and a cultural landscape.

Nine international boundary markers are also included in the project area. These permanent monuments are generally 6 to 11 feet high (1.83 to 3.35 m), and obelisk in form. These masonry and cast-iron boundary markers are the result of a resurvey of the boundary, which established 268 monuments along the U.S.-Mexico boundary under the Gadsden Treaty. The maintenance costs are equally shared by the United States and Mexico, in accordance with the provisions of the International Boundary and Water Commission. Joint inspections and maintenance operations are conducted at least every five years. Each marker within Organ Pipe Cactus National Monument is eligible for listing on the National Register of Historic Places. To prevent any undermining or damage to the foundations of the barriers, no excavation for barrier fence posts would occur within 10 feet of the boundary monuments. Therefore, the vehicle barrier may be placed around the monuments to accommodate the 10-foot distance.

A cultural resource specialist would monitor the site during construction, and construction area limits would be flagged to ensure that any historic structures or the cultural landscape would not be affected. Any vegetated areas associated with the cultural landscape that might be inadvertently disturbed during construction would be revegetated. Given these measures, historic structures and buildings, and cultural landscapes were dismissed from further consideration.

Coronado National Memorial. Three international boundary markers exist within Coronado National Memorial. The closest marker to the project area is approximately 1.5 miles west of the western end of the proposed barrier. Because there would be no direct impacts as a result of the proposed action, the topic of historic structures and buildings was dismissed from further consideration.

A cultural landscape inventory was completed for Montezuma Ranch at Coronado National Memorial in 1999. The investigation concluded that while the ranch was of local significance, it has severe integrity problems and is not eligible for listing on the national register as a historic landscape. Therefore, no further inventory has been planned. The entire memorial viewshed is scheduled for inventory after 2005 (impacts to viewsapes are discussed under the “Visitor Experience” impact topic).

At Coronado cultural landscapes are important in carrying out the memorial’s purpose, particularly as related to preserving the views of Mexico and the United States, which provide the setting for contemplating Coronado’s expedition. Because the views are so important, they are addressed in this document under “Visitor Use, Understanding, and Appreciation,” rather than under “Cultural Landscapes.” Aside from these important viewsapes, no cultural landscapes exist at Coronado National Memorial that would be impacted by any of the alternatives proposed for this project.

Because the integrity of the present cultural landscapes at either park unit would not be affected by any of the alternatives described in this environmental assessment, cultural landscapes were dismissed as an issue.

Ethnographic Resources

Organ Pipe Cactus National Monument. Ethnographic resources are defined by the National Park Service as any “site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it” (NPS 1998).

Quitobaquito Well is a large open pond that has been an attraction to humans and wildlife for centuries. O’odham people regard water from the springs at Quitobaquito as sacred and retrieve

water when needed. American Indian tribes traditionally associated with the lands of Organ Pipe Cactus National Monument and others with whom monument staff regularly consult were apprised of the action, and a site visit was conducted on February 7, 2003.

Quitobaquito Well and Springs are located approximately 200 feet away from construction limits. However, as with all cultural resources identified and potentially affected with the proposed action, a cultural resource specialist would monitor the site during construction, and construction area limits would be flagged to ensure that Quitobaquito Well and Springs would not be affected by construction. Given these measures, ethnographic resources were dismissed from further consideration.

Coronado National Memorial. No ethnographic resources have been identified at Coronado National Monument, therefore, this topic has been dismissed from further consideration.

Prime and Unique Farmlands

In August 1980 the Council on Environmental Quality directed that federal agencies must assess the effects of their actions on farmland soils classified by the U.S. Department of Agriculture's Natural Resource Conservation Service as prime or unique. Prime or unique farmland is defined as soil that particularly produces general crops, such as common foods, forage, fiber, and oil seed; unique farmland produces specialty crops, such as fruits, vegetables, and nuts.

No prime and unique farmlands exist at either park unit. Therefore, this topic was dismissed as an impact topic.

Indian Trust Resources

Secretarial Order 3175 requires that any anticipated impacts to Indian trust resources from a proposed project or action by U.S. Department of the Interior agencies be explicitly addressed in environmental documents.

No Indian trust resources exist in either Organ Pipe Cactus National Monument or Coronado National Memorial. The lands comprising the park units 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.

Socioeconomic Impacts

The proposed action would neither change local and regional land use nor appreciably impact local business or other agencies. Communities near both park units could experience benefits from increased tourism if visitors felt safer visiting the parks. Park visitation trends are not yet available for 2002 to indicate if perceived safety concerns resulting from Kris Eggle's death and publicity about Arizona border issues have impacted visitation. However, visitation at Organ Pipe Cactus has steadily increased between 1997 and 2001. Visitation at Coronado has remained relatively stable in the same time period, fluctuating slightly.

Drug smugglers would experience negative socioeconomic impacts due to decreased revenue from smuggling activities. However, because this is an illegal activity, it is not evaluated in this document.

Socioeconomic impacts were dismissed from this analysis.

Environmental Justice

According to the U.S. Environmental Protection Agency, 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 environmental laws, regulations and policies. Fair treatment means that no group of people, including a racial, ethnic, or socio-economic 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.

Presidential Executive Order 12898, “General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” requires all federal agencies to incorporate environmental justice into their missions by identifying and addressing the disproportionately high and/or adverse human health or environmental effects of their programs and policies on minorities and low-income populations and communities. The proposed action would not have disproportionate health or environmental effects on minorities or low-income populations or communities as defined in the Environmental Protection Agency’s *Draft Environmental Justice Guidance* (July 1996). Therefore, environmental justice was dismissed as an impact topic.

Adjacent Land Agencies (Coronado National Memorial Only)

The proposed action would not affect adjacent land agencies at Coronado National Memorial because the vehicle barrier would extend for only 1 mile along the international boundary, terminating within the memorial and at its eastern border. State land abuts the park to the east, where a vehicle barrier has already been installed (see Figure 3). Therefore, the presence of a vehicle barrier at Coronado would not reroute additional traffic onto adjacent land. For these reasons, the adjacent land agencies topic was dismissed for Coronado National Memorial.

Figure 3: Existing Vehicle Barrier East of Coronado



INTERNAL AND PUBLIC SCOPING

Scoping is a process to identify the resources that may be affected by a project proposal, and to explore the possible alternative ways of achieving the proposal while minimizing impacts. Internal scoping meetings were conducted with appropriate NPS staff at Organ Pipe Cactus National Monument and Coronado National Memorial, and external scoping was conducted with the public and interested and affected groups and agencies.

Internal scoping was conducted by an interdisciplinary team consisting of employees at both parks, planning professionals from the National Park Service, Intermountain Support Office in Denver, and a planning consulting firm, URS Corporation. Team members visited Coronado National Memorial on December 9 and 10, 2002, and Organ Pipe Cactus National Monument on December 11 and 12, 2002, to discuss the purpose and need for the project; important resources; values, issues, and concerns; past, present, and reasonably foreseeable actions; ongoing maintenance activities; and possible mitigation measures of the proposed action. Affiliated Native American tribes were contacted by letters dated January 22, 27, and 29, 2003, to solicit any interests or concerns with the proposed action. The National Park Service met with the Tohono O'odham Nation representatives on February 7, 2003, to discuss their issues and concerns.

A public scoping letter dated November 18, 2002, was mailed to interested and affected parties on the mailing lists of both park units. On Sunday, December 8, 2002, the *Arizona Daily Star* printed an article about the "Park Service planning steel barriers at the border." On Sunday, December 8, the *Sierra Vista Herald* also printed an article about the proposed vehicle barrier at Coronado. On Wednesday, November 27, 2002, the *Ajo Copper News* printed a story about the proposed vehicle barrier at Organ Pipe and Coronado. All articles listed a postal and e-mail address through which the public could respond. On Tuesday, December 10, *USA Today* also included a short description of the proposal under "Arizona" in its national news briefs.

A total of 81 public comments were received. A majority of the public (58 respondents) felt that a vehicle barrier should be constructed at both parks. Seven additional respondents also supported the barrier, but with reservations. Ten respondents were opposed to the vehicle barrier, some noting that illegal entry into the United States is too complicated to be addressed by a barrier. One respondent was uncertain about the proposal, and five simply had questions or requested to be placed on the mailing list.

In addition to responding for or against the barrier, some respondents also mentioned other concerns. Eleven expressed concerns about the ability of wildlife to move through the barrier, and 19 were concerned about the barrier pushing illegal traffic onto neighboring lands. Five respondents noted that they are currently afraid to visit the parks due to safety concerns. Four respondents expressed concerns about the visual effects of a vehicle barrier.

One respondent suggested placing boulders as a deterrent, rather than a fence. Another suggested using an electric fence instead of the proposed design.

Some individuals also expressed concerns about habitat fragmentation, cumulative effects, wilderness at Organ Pipe Cactus, maintenance and possible breach of the barrier, use of the 60-foot easement for enforcement purposes, the ability of water to flow through the barrier, wildfire suppression on both sides of the border, and the possibility that ATVs could drive through the fence. Issues raised about construction included introduction of invasive plants and creation of a construction road.

ALTERNATIVES CONSIDERED

The alternatives presented in this document are the result of agency and public scoping input, and their impacts are analyzed in accordance with the National Environmental Policy Act. All alternatives must be consistent with the purpose and significance of Organ Pipe Cactus National Monument and Coronado National Memorial, and they must meet the purpose of and need for action, as well as the objectives for the project. Six alternatives, including the no-action alternative, were originally considered, four of which were dismissed for various reasons (see page 41).

Alternative A is the no-action alternative; it would take no additional action to prevent vehicles from illegally entering the park units from Mexico. The no-action alternative is the baseline for analyzing the impacts of the alternatives. Alternative B, the preferred alternative, proposes the construction of a vehicle barrier along the park units' international boundary with Mexico.

Table 2 at the end of this chapter evaluates how well each alternative would meet the objectives for this project. Table 3 summarizes the impacts of each alternative for Organ Pipe Cactus National Monument, and Table 4 for Coronado National Memorial.

ALTERNATIVE A: NO-ACTION ALTERNATIVE

Under the no-action alternative current operations at both Organ Pipe Cactus National Monument and Coronado National Memorial would continue. No additional actions would be taken to prevent vehicles from illegally entering the park units from Mexico.

ALTERNATIVE B: PREFERRED ALTERNATIVE — MIXED-STYLE VEHICLE BARRIER

Under alternative B a vehicle barrier composed of three styles would be installed along 30 miles of international border at Organ Pipe Cactus National Monument and approximately 1 mile at Coronado National Memorial. The barrier would be placed on the south side of the existing border roads that parallel the boundary. At Organ Pipe Cactus it would extend from the southeastern to the southwestern boundary, and at Coronado it would extend between the southeastern boundary and Smuggler's Wash.

The barrier at both parks would consist of railroad rail cross pieces placed 3 feet high, anchored to upright posts placed every 5 feet. Uprights would alternate between 5 and 6 feet aboveground. The barrier would include an electronic component that would alert monitors to any breach in the barrier. The type of barrier used would depend on the risk of breach in a particular location. The three barrier types proposed include:

- *Rail-on-rail (see Figure 4)* — This style uses discrete, individual footings for each upright rail, rather than continuous concrete footing. Rails would be placed as posts in augured holes drilled 5 feet deep, then filled with concrete. No trenching or continuous concrete footers would be constructed.
- *Rail-on-concrete-filled post (see Figure 5)* — Steel tubing bollards filled with concrete would be anchored in individual cement footings, similar to the rail-on-rail style. Initial design estimates indicate that it takes approximately 1 hour to cut the rail-on-post barrier, so this type barrier would be used where illegal crossings are highest (such as Lukeville). The barrier

would be structurally adequate to resist impacts from a 7,000-pound vehicle hitting the barrier at 40 miles per hour.

- *Normandy style (see Figure 6)* — This style is constructed entirely of rail and with no foundation required and would be kept in place by weight. The barrier can be put in place by helicopter, and it would be used where terrain or subsurface conditions make post construction difficult.

BARRIER AT ORGAN PIPE CACTUS NATIONAL MONUMENT

At Organ Pipe Cactus National Monument the barrier would consist of approximately 7 miles of railroad rail-on-post barrier, 23 miles of rail-on-rail barrier, and 1 mile of the Normandy barrier. The rail-on-post style would be used in the Lukeville area of Organ Pipe Cactus near the port of entry, where the vast majority of illegal crossings occur. The Normandy barrier would be placed by helicopter in the monument's wilderness area (which would comprise approximately 0.25 mile) in order to prevent the possibility of vehicles driving around Sonoyta Hill at the monument's boundary with Cabeza Prieta National Wildlife Refuge. This area is a strategic topographic point that isolates a large portion of the park (which is the most heavily visited and includes the campground and visitor center) from potential encounters with vehicles.

The dirt road adjacent to the boundary fence would be widened from 12 feet to 20 feet (see Figures 7–10). The vehicle barrier would occupy a 3-foot strip adjacent to the existing boundary except in the 0.75-1 mile stretch of land in the mesquite bosque east of Dos Lomitas Ranch. Because the Mexican road that parallels the border has been lowered, the barrier would be moved 10 to 15 feet north so that it would be protected from bank erosion. The patrol road that parallels the boundary would be widened to 30 feet in some areas to accommodate passing vehicles. These passing areas or turnaround sites would be located mostly on areas with low-density vegetation or devegetated, degraded sites.

During construction a total of 35 sites would be cleared and used as staging areas (materials storage) and turnaround sites for large vehicles. Eight of these sites have been impacted severely by border activities and are devegetated or nearly so. The existing condition of the remaining 28 sites ranges from poor to pristine. The staging areas would extend approximately 30 feet beyond the primary 30-foot-wide disturbance area and would vary in length from approximately 100 to 250 feet (NPS 2003c). A total of 14 connecting roads would be used to access the border from South Puerto Blanco Drive. Previously disturbed areas would be used wherever possible. No wilderness areas would be affected on the south side of the South Puerto Blanco Road and a 150-foot-wide non-wilderness corridor exists on the north side of the road (P. Rowlands, NPS, pers. comm., P. Steinholtz, URS, Jan. 29, 2003).

The proposed foundation depths on the barrier uprights would be a minimum of 5 feet in order to avoid any potential for scour associated with even fairly large storm events (15 inches of scour for a 100-year event). Therefore, no additional scour protection is proposed. No structures would be placed in washes other than the barrier itself.

All uprights would be anchored in holes drilled 5 feet deep (or 8 feet in washes), then filled with concrete to 2 inches above the ground, where the concrete would slope away from the steel pipe in order to shed water (B. Mikus, NPS, pers. comm., P. Steinholtz, URS, Apr. 3, 2003).

In some areas of Organ Pipe Cactus National Monument, a barbed-wire livestock fence would remain in place, approximately 2 feet south of the new vehicle barrier. In other areas, the existing fence would be removed. In areas where livestock are present in Mexico, one strand of barbed wire

would be placed above the barrier's horizontal rail, and one strand of smooth wire would be placed no less than 18 inches above the ground, below the horizontal rail. This would be done to prevent illegal grazing in the monument, while allowing wildlife to cross.

BARRIER AT CORONADO NATIONAL MEMORIAL

Coronado's barrier would be located in the southeastern corner of the park, along a corridor approximately 20 feet wide and extending 0.5 mile west from the east boundary of the park along the present border road. The barrier would continue northwest along the same dirt road for another 0.45 mile, for a total length of 0.95 mile (see Figure 11). The section along the border road would consist of upright railroad rails and a horizontal cross piece (rail-on-rail style). The northwestern section of the barrier (along the north-south access road) would consist only of concrete-filled steel posts with no horizontal cross piece. The existing barbed wire boundary fence would remain (NPS 2003e).

The primary staging area would be located outside the park in a previously disturbed area immediately adjacent to the southeast corner of the park. The project would result in a net increase of disturbed ground less than 1.0 mile long and 11 feet wide, plus 2 turnaround areas.

Coronado's construction site would be accessed primarily from the east by way of existing public dirt roads and by way of the improved border road east of the memorial. Smaller vehicles could also access the construction site on E. Forest Lane; however, no improvements would be made to that road (NPS 2003e). Construction materials would be stored at Montezuma Ranch, a disturbed area recently acquired by the National Park Service. Staging would occur primarily east of the park along the border road (outside the memorial's boundaries). A large (66-foot diameter) disturbed area immediately outside the park's southeast corner, which was used during a previous border improvement project, could be used for staging.

MITIGATING MEASURES INCLUDED IN ALTERNATIVE B

The area of disturbance at Organ Pipe Cactus National Monument would be approximately 30 feet wide and 30 miles long, for a total of approximately 109 acres. Of that area, approximately 43.6 acres have already been disturbed, in the form of a 12-foot-wide boundary road within the 60-foot boundary easement.

- The proposed barrier design would be wildlife friendly. The horizontal rails would be placed 36 inches above the ground, which is higher than the lowest wire on most wildlife friendly livestock fences, which are typically 16 to 22 inches above the ground (University of Arizona 2001; Jackson Hole Wildlife Foundation 2002). In cases where a livestock fence is used in addition to the vehicle barrier, a smooth wire would be placed no less than 18 inches above the ground, below the horizontal rail.
- Construction activity would occur in the existing border easement that parallels the international boundary at each park unit. The roads are approximately 15-20 feet wide and may be widened to accommodate construction activities. However, widening would not exceed 30 feet, thus construction activities would remain within the 60-foot easement defined for patrol and protection purposes. No road construction would occur in wilderness areas of Organ Pipe Cactus National Monument.
- Staging areas for construction supplies and equipment would be limited to the smallest extent possible to avoid disturbance of vegetation, wildlife, threatened or endangered species, and cultural resources (see Figure 8). Previously disturbed sites would be used as

much as possible. No staging areas would occur in known Sonoran night-blooming cactus (*Peniocercus striatus*) locations.

- A revegetation plan would address all areas that would be disturbed by construction activities at both park units, such as staging areas and the width of denuded area. Removal or damage to existing plants would be avoided as much as possible. A revegetation plan would be developed to address reseeding in disturbed areas in order to reduce erosion.
- A road maintenance plan for both parks would be developed to address equipment needs, amount and location of water for dust abatement, feasibility of dust abatement treatments other than water, and stabilization treatments for soft areas. This plan would also address methods for reducing erosion and construction activities in washes and culverts.
- Security would be provided to protect construction materials from theft and vandalism during construction. A security plan would be developed to define required security measures, which would be adhered to during construction.
- The disturbed and restored areas would be continually monitored to eradicate invasive plants along the border if they colonize as a result of construction (NPS 2003a).
- No excavation would occur within 10 feet of the permanent IBWC monuments in order to prevent undermining or damage to the foundations, and to allow room for future maintenance activities. Vehicle barriers would be placed around the monuments in order to accommodate the 10-foot distance.
- The vehicle barrier would be allowed to rust naturally and would not be painted.

Mitigating Measures Specific to Organ Pipe Cactus National Monument

Sections of the dirt road parallel to the border east of Lukeville in Mexico have undercut the existing fence. In these areas, the barrier would be offset from the border 2 to 3 feet north and posts would be set 10 feet deep in order to prevent the barrier from collapsing and to mitigate the appeal of tunneling under it from the low road in Mexico.

Two existing roads would be used to access the construction area from South Puerto Blanco Drive, west of Highway 85 (see Figure 7).

The Quitobaquito Springs and Pond would be avoided. Activities planned under this alternative would remain strictly within the designated operation zone, which is outside the Quitobaquito area. However, because of Quitobaquito's close proximity to the border and sensitive habitat, the following mitigation measures would be followed to further protect this area:

- No staging or storage of materials, vehicles, or fuel would be permitted within 500 feet of Quitobaquito (e.g., no cement mixing, washing or refueling of equipment) in order to prevent chemical contamination and miscellaneous anthropogenic impacts.
- All construction activities, impacts, and equipment would occur no closer than 200 feet from the southern edge of the pond.
- Dust abatement measures would be applied within 0.5 mile of Quitobaquito, using non-toxic, neutral sources (e.g., water).
- No water would be taken from the Quitobaquito system for any project-related purposes.
- To prevent hydrological disturbance, no blasting would occur within 2 miles of Quitobaquito. Prior to drilling holes for uprights, a geohydrologist familiar with the published

research on Quitobaquito geohydrology would evaluate the project design and methods to determine if drilling could affect subsurface hydrology.

- A fully equipped fire suppression crew would be present during construction activities at Quitobaquito. A no-smoking area would be defined within 500 feet of Quitobaquito.
- All vegetation removed for construction purposes would be immediately taken away from the area in order to reduce the threat of fire.
- The restoration approach for Pleistocene Epoch terraces would be defined in a vegetation management plan.

Aguajita Springs is an ephemeral stream and would be avoided. Activities planned under this alternative would remain strictly within the designated operation zone, which is outside Aguajita Springs. However, because of the springs' proximity to the border and sensitive habitat, the following mitigation measures would be followed to further protect this area:

- No grading would occur in the stream corridor; the existing stream channel would remain the original size and form.
- The construction corridor would be no more than 15 feet wide through the riparian area.
- The established boundary limits would be marked by flagging or orange plastic fencing.
- No fueling or storage of fuels or other contaminants would occur in the area.

To ensure that no impacts would occur to archeological resources, the following measures would be taken:

1. If concealed archeological resources are encountered during project activities, all necessary steps will be taken to protect them and to notify the park consulting archeologist.
2. Where recorded cultural resources are adjacent to the existing fence line road, construction activities will not exceed the current width of the road.
3. Archeological sites in areas of possible impact due to road widening or construction will be flagged.
4. An archeologist will monitor all construction activities in the vicinity of the archeological sites to ensure that archeological sites are avoided.
5. An archeologist will monitor activities related to the construction of the Normandy barrier and the two access roads.

Mitigation Specific to Coronado National Memorial

Two agave monitoring plots and one small mammal monitoring plot have been established by NPS staff near the border. Proposed construction activities would occur outside these areas; therefore, these plots would not require relocation.

Figure 4: Rail-on-Post Barrier Style

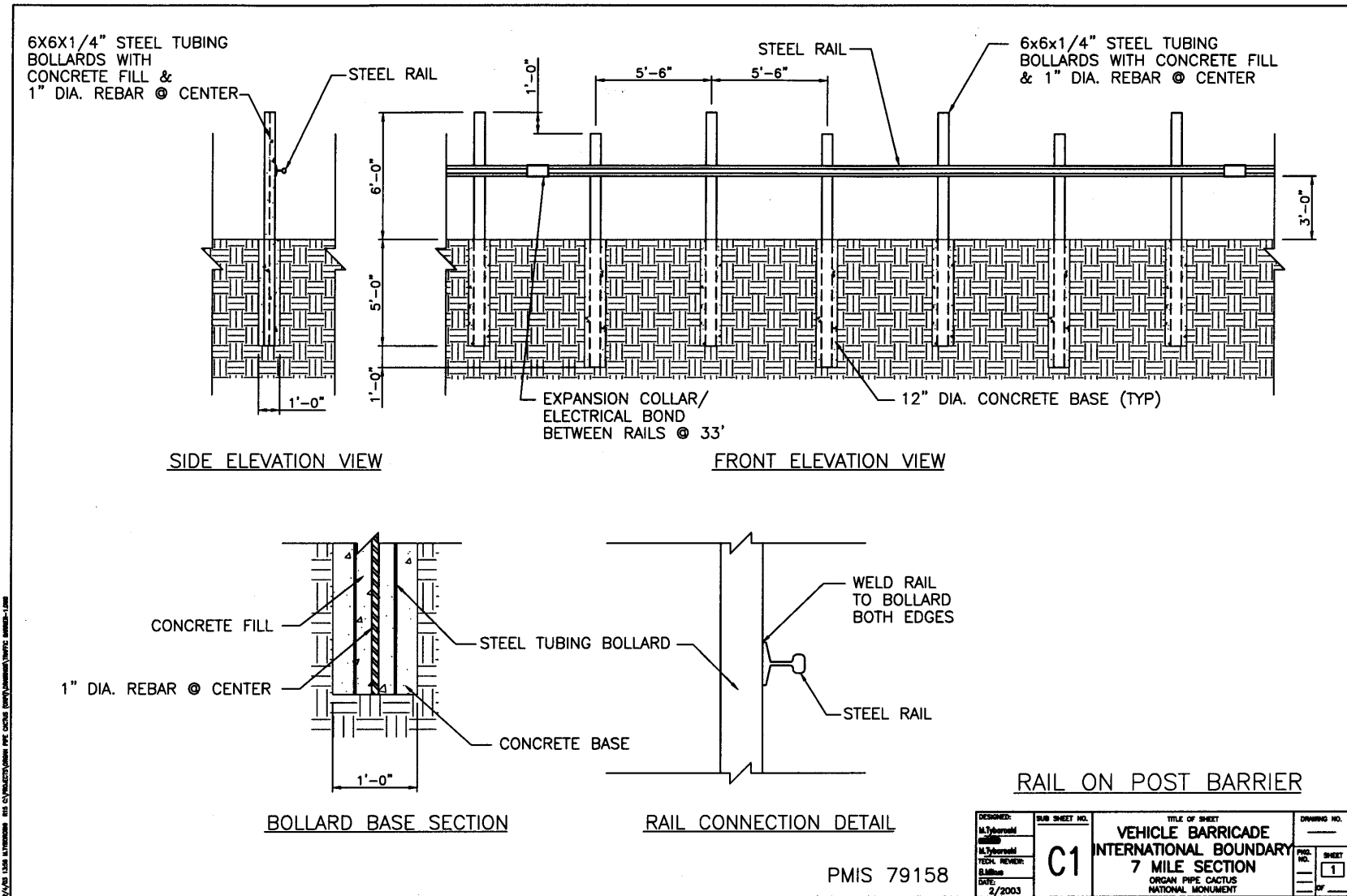
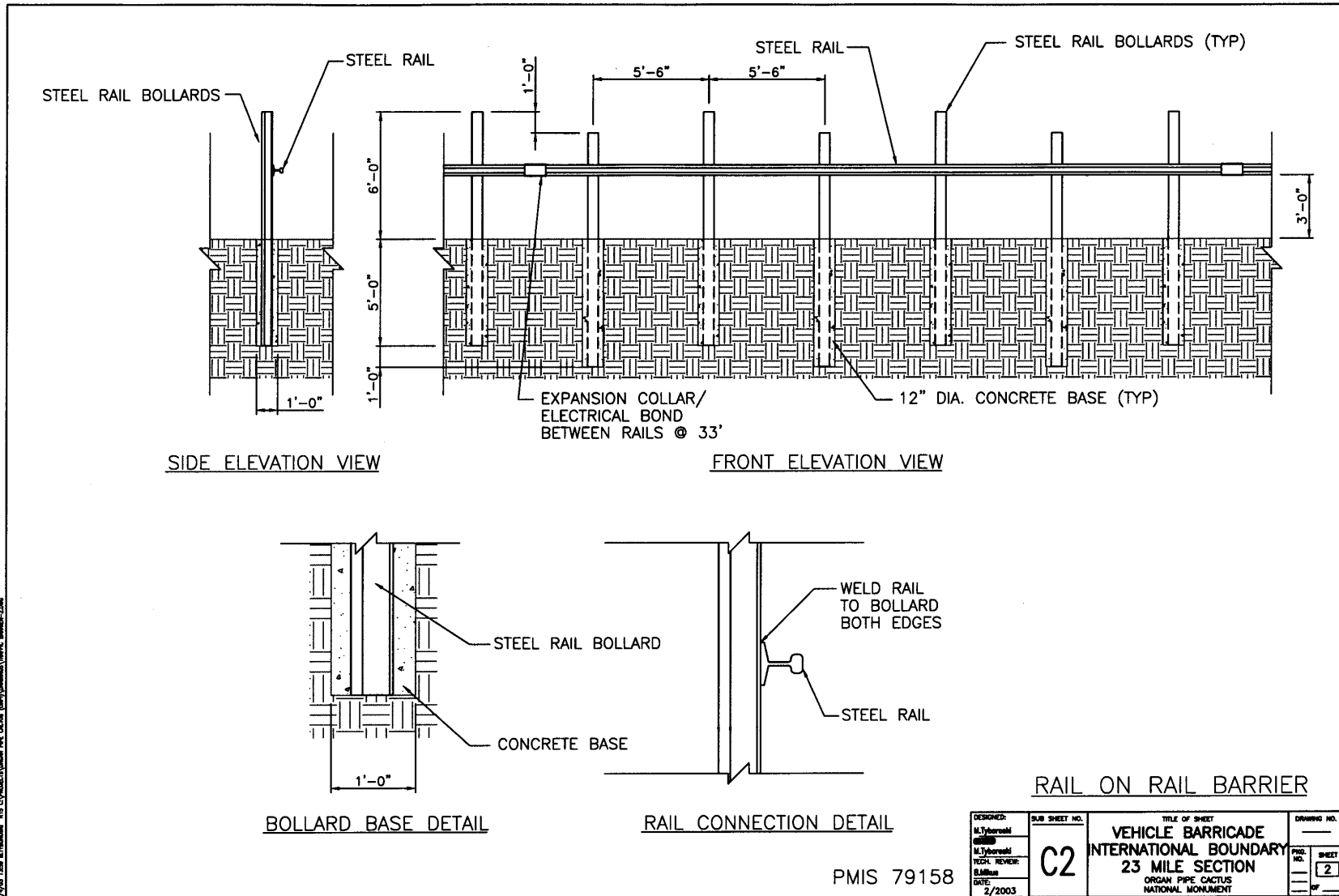
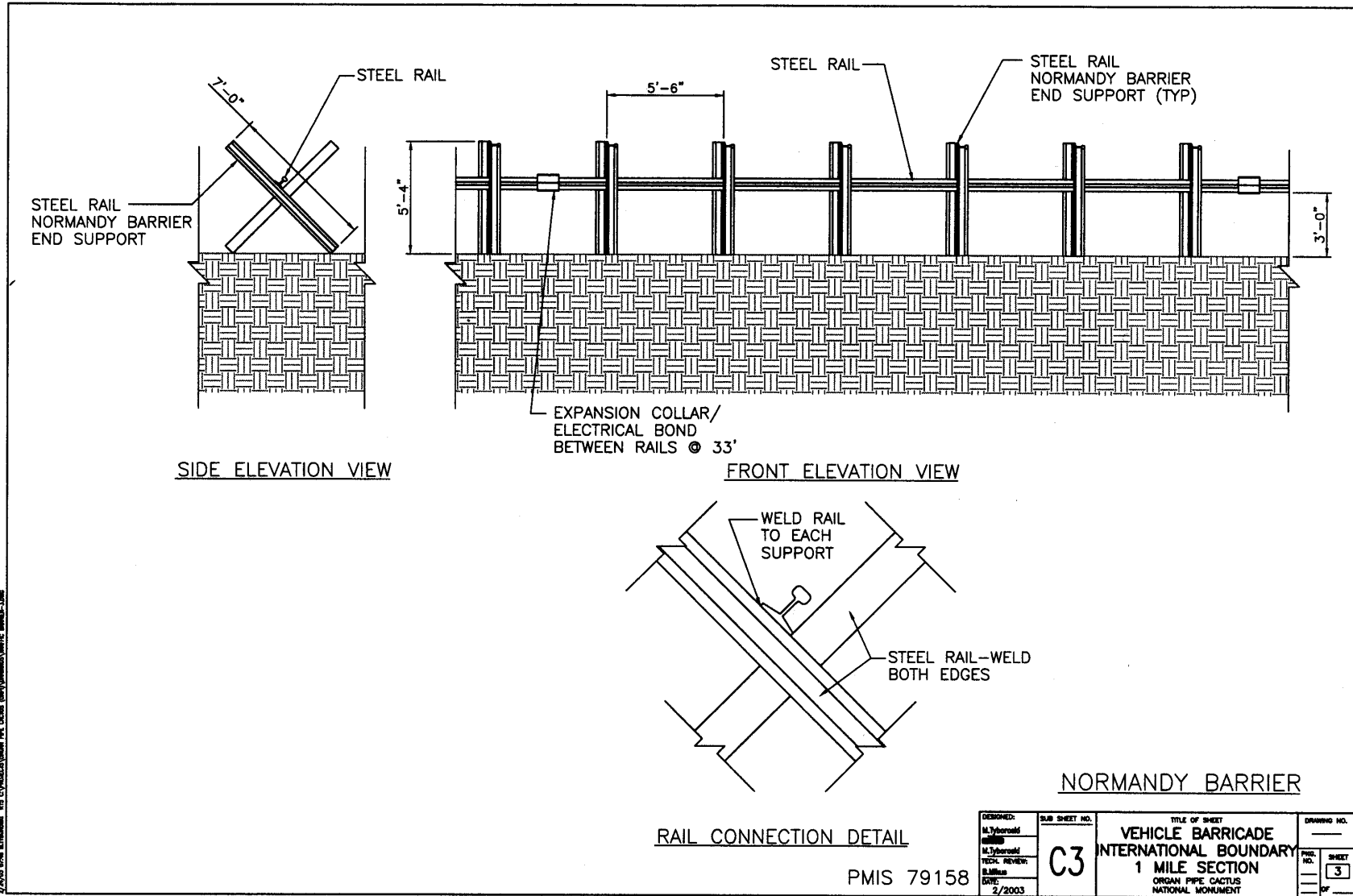


Figure 5: Rail-on-Rail Barrier Style



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Figure 6: Normandy Barrier Style



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Figure 7: Alternative B — Organ Pipe Cactus National Monument, West End to Puerto Blanco Drive

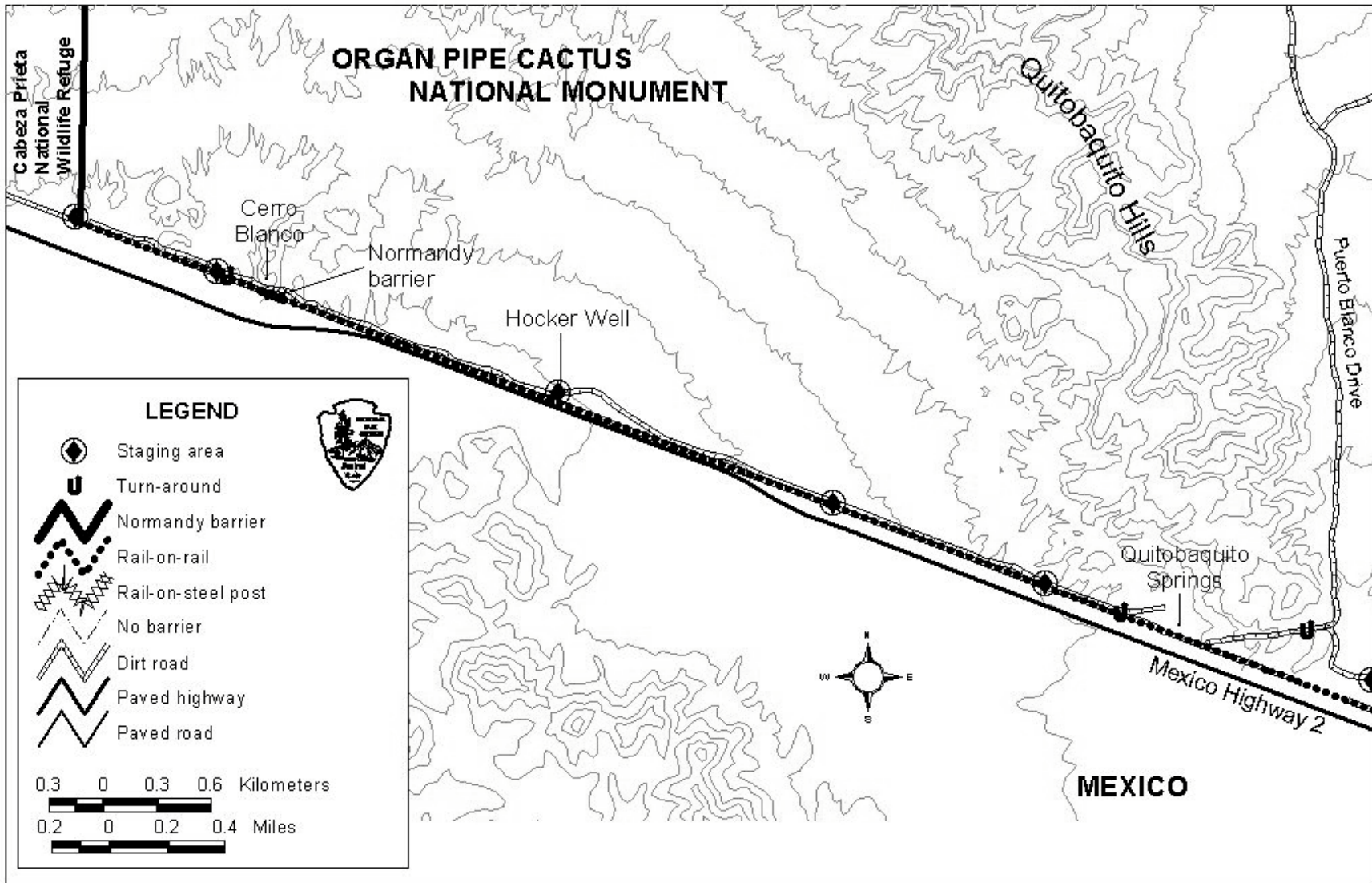


Figure 8: Alternative B — Organ Pipe Cactus National Monument, South Puerto Blanco Drive to Senita Basin Road

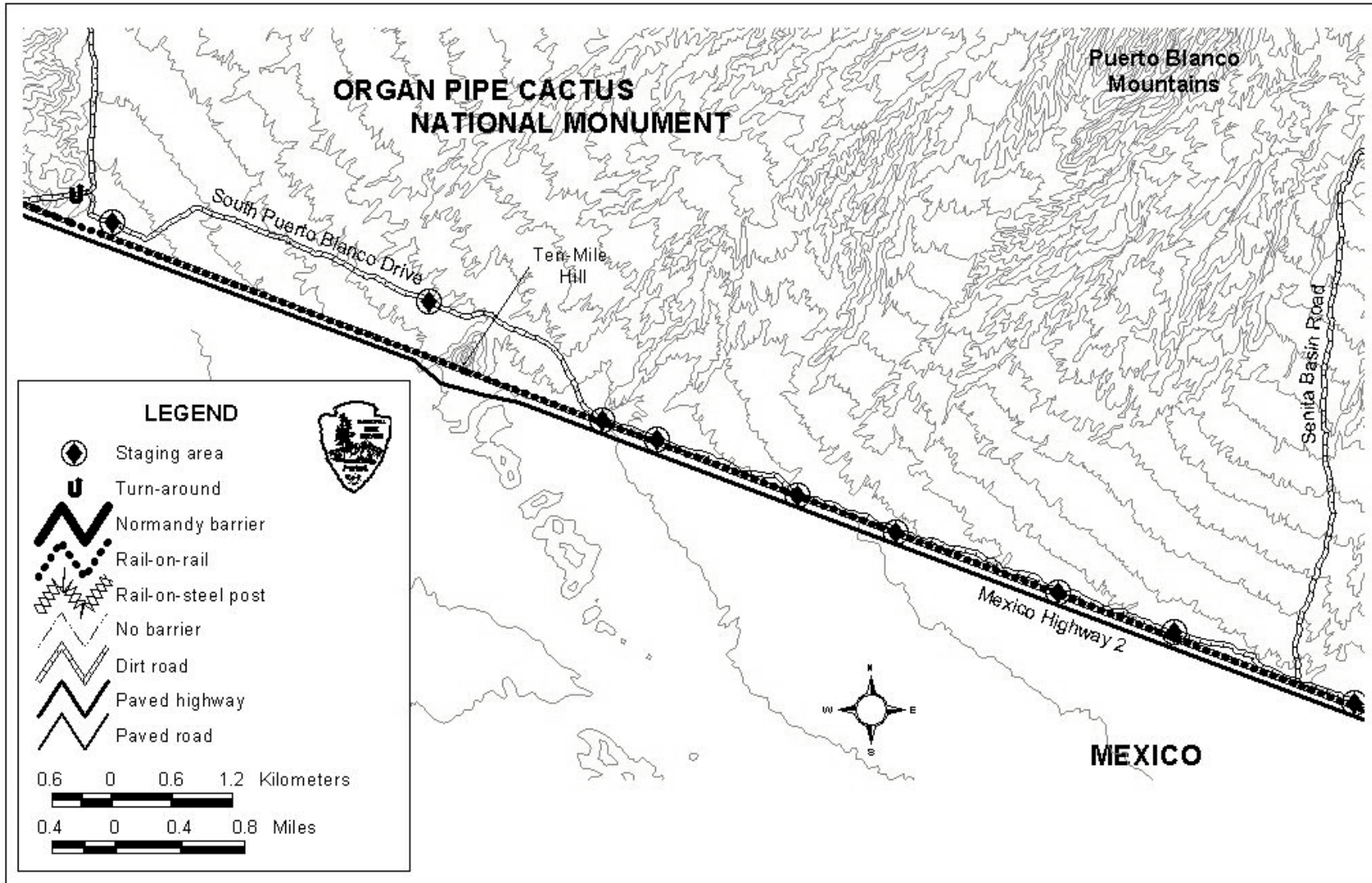


Figure 9: Alternative B — Organ Pipe Cactus National Monument, Senita Basin Road to Gachado Line Camp

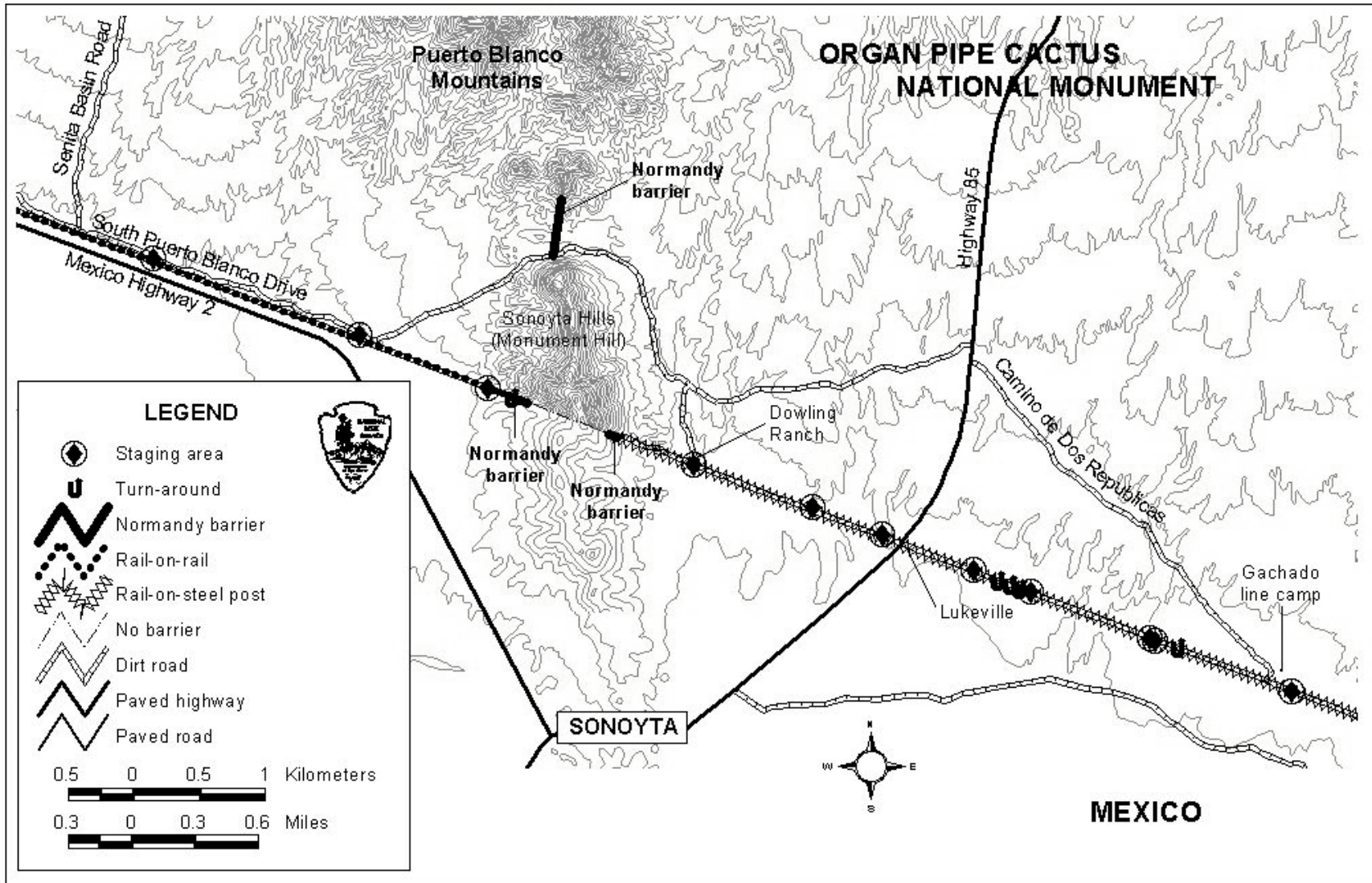


Figure 10: Alternative B — Organ Pipe Cactus National Monument, Gachado Line Camp to East End

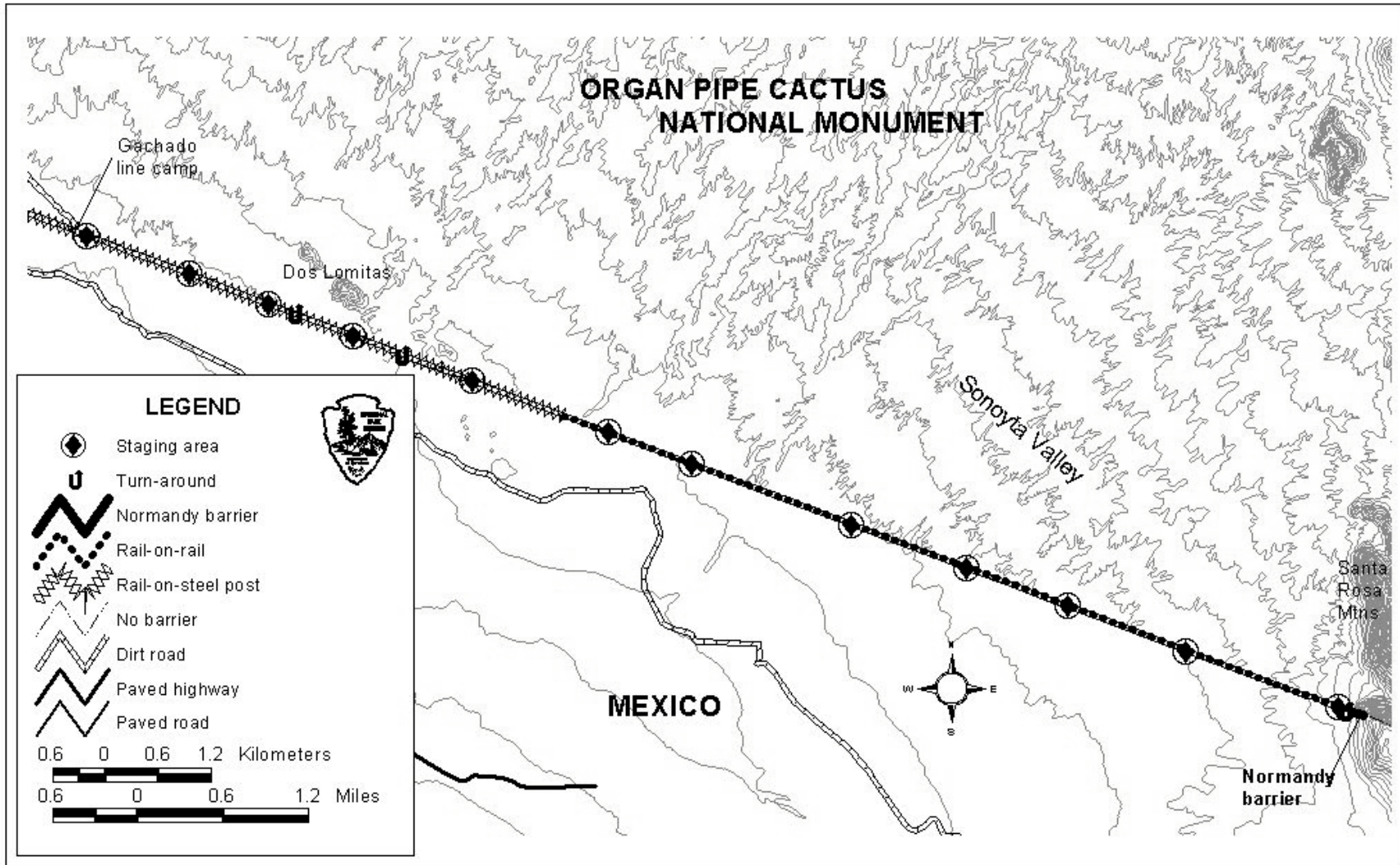
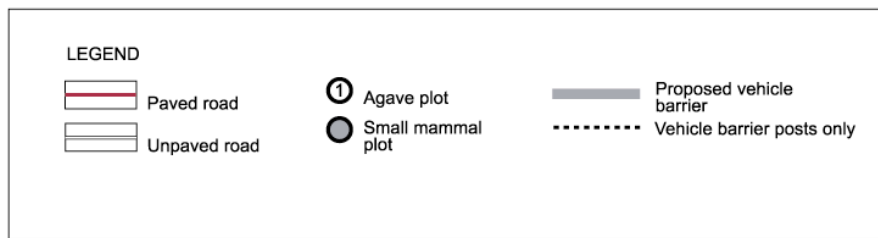
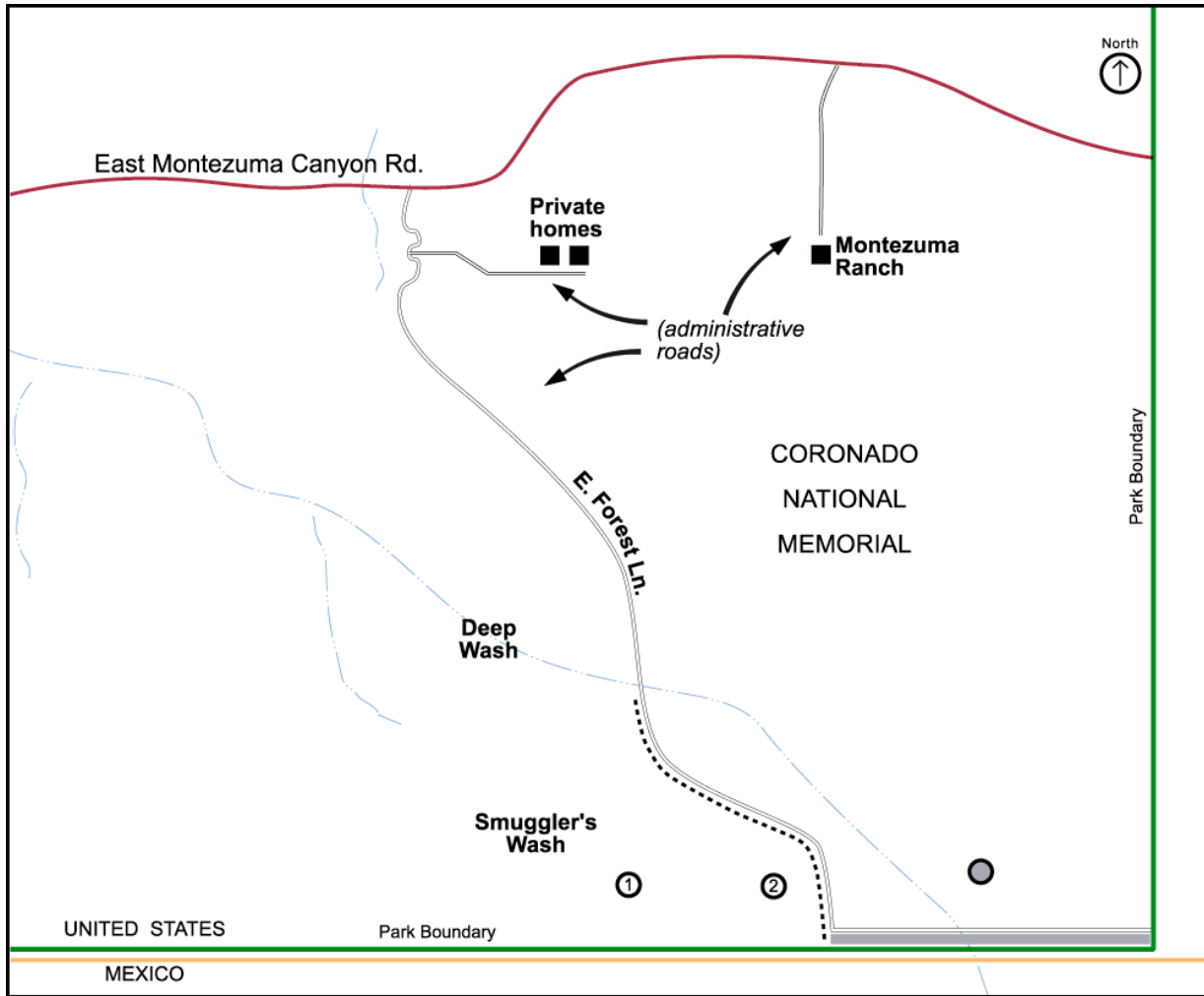


Figure 11: Alternative B — Coronado National Memorial



ALTERNATIVES CONSIDERED BUT DISMISSED

The following alternatives were considered but were dismissed for the reasons discussed below.

HEAVY ENFORCEMENT

Under this alternative current law enforcement staff at Organ Pipe Cactus National Monument would be increased from 16 to 96 full-time employees in order to emulate USBP staffing in the vicinity of Douglas, Arizona. The USBP office at Why, Arizona, which is the first community north of Organ Pipe Cactus, would also have to increase staff in order for enforcement presence in the area of the monument to be similar to that in the Douglas area. No staff increase would occur at Coronado National Memorial.

Increased law enforcement would result in increased impacts from added vehicle patrols along the border. Border roads would be widened with increased use, and noise would increase due to additional patrol activities. The need for road maintenance would also increase.

Despite increases in law enforcement, this alternative would not prevent illegal vehicles from entering the park units. Should an illegal vehicle cross the border, law enforcement personnel cannot pursue the vehicle into the national monument's wilderness area. Therefore, park resources would continue to be harmed, and the safety of park employees and visitors would continue to be at risk. This alternative would not satisfy the purpose and need described in this document.

ENFORCEMENT AND SURVEILLANCE

Under this alternative the current law enforcement staff at Organ Pipe Cactus National Monument would be increased from 16 full-time employees to 40. In addition, increased video surveillance would be implemented along the monument's border, with 10 towers installed at Organ Pipe Cactus and 1 tower at Coronado. The range of the cameras would include overlapping camera towers to fully cover the park units' borders.

Despite increases in law enforcement, this alternative would not prevent illegal vehicles from entering the park units, as described for the previous alternative. Therefore, this alternative would not satisfy the purpose and need described in this document.

USE ONLY THE RAIL-ON-RAIL STYLE BARRIER

Using only rail-on-rail style barrier was not selected because the rail-on-post style proposed under alternative B would take 1 hour to breach, as opposed to approximately 20 minutes for the rail-on-rail style. Therefore, the rail-on-post style would be most useful in areas of highest illegal crossings. The Normandy-style barrier would be used because it could be placed aerially, thus helping protect wilderness values in a small portion (1/4 mile) of Organ Pipe Cactus, and eliminating the need to construct a road on steep hills, such as at the terminus on the Santa Rosa Mountains.

USE BOULDERS AS A BARRIER

During the scoping phase of this project, a suggestion was made to block illegal vehicular traffic by placing boulders along the border, rather than erecting a barrier. Park staff at Organ Pipe Cactus have tried this approach without success. Even though boulders were placed with mechanical cranes and heavy equipment, undocumented aliens were able to move the boulders, allowing illegal vehicles

to enter the park. Therefore, this alternative would not satisfy the purpose and need described in this document.

THE ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative is defined by the Council on Environmental Quality as the alternative that best meets the following criteria or objectives, as set out in section 101 of the National Environmental Policy Act:

1. Fulfill the responsibilities of each generation as trustee of the environment for succeeding generations.
2. Ensure for all Americans a safe, healthful, productive, and aesthetically 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, whenever possible, an environment that supports diversity and variety of individual choice.
5. Achieve a balance between population and resource that will permit high standards of living and a wide sharing of life's amenities.
6. Enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

Based on the analysis prepared in this environmental assessment, alternative B is considered the environmentally preferred alternative.

The no-action alternative, which would continue existing methods to prevent illegal vehicular use of the park units, would not satisfy the first four requirements detailed above. As illegal vehicular use of the park units' continued, the biological and physical environment would continue to be degraded by impacts to wildlife, threatened or endangered species, plant species, and soils, thus diminishing the quality of the environment for future generations. Illegal roads are being created in the park at a rate of approximately 50 miles per year (based on activity over the last three years). In addition, illegal drug smuggling through the park units, which is more effective in a vehicle, does not ensure a safe, healthful, or productive environment, as exemplified by the recent death of the Organ Pipe Cactus park ranger. The impacts of vehicular use on the backcountry also degrade the aesthetically and culturally pleasing aspects of the surroundings and results in degradation, risk of health or safety, or other undesirable and unintended consequences. Illegal vehicles are also used at Organ Pipe Cactus to transport wood from historic structures into Mexico to be used for firewood (T. Tibbitts, NPS, pers. comm., P. Steinholtz, URS, Dec. 11, 2002), causing degradation of important historic and cultural aspects of our national heritage.

The no-action alternative would also impede achieving a balance between population and resource use because people have expressed reluctance to visit Organ Pipe Cactus National Monument due to fear for personal safety. A wide sharing of life's amenities is diminished if people are afraid to visit the parks.

The no-action alternative would not impact the quality of renewable resources or inhibit the attainable recycling of depletable resources.

In contrast to the no-action alternative, alternative B would satisfy the majority of the six requirements listed above. Constructing a vehicle barrier at the park units would help preserve the biological and physical environment (including wildlife, threatened or endangered species, plant species, and soils) for future generations by impeding illegal traffic through the backcountry. The amount of illegal drug smuggling would be reduced, helping to ensure a safe, healthful, and productive environment for park visitors and employees. A vehicle barrier would also help promote the aesthetically and culturally pleasing aspects of the surroundings, while reducing the amount of degradation, risk of health or safety, or other undesirable and unintended consequences. Historic structures at Organ Pipe Cactus National Monument would be better preserved because illegal vehicles would no longer be used to transport wood from these structures into Mexico for firewood (T. Tibbitts, NPS, pers. comm., P. Steinholtz, URS, Dec. 11, 2002). A vehicle barrier would help maintain the integrity of important historic and cultural aspects of our national heritage.

The existence of a vehicle barrier and the resultant decrease in drug smuggling could decrease the public's perceived risk of visiting the park units, perhaps resulting in increased visitation. This would help achieve a balance between population and resource use, permitting a "wide sharing of life's amenities."

As under the no-action alternative, alternative B would not impact the quality of renewable resources or inhibit the attainable recycling of depletable resources.

Table 2: Methods Each Alternative Uses to Meet Objectives

Objective	Alternative A: No-Action Alternative	Alternative B: Preferred Alternative — Mixed Style Barrier
Floodplains and Soils		
Protect soils and floodplains from disturbance and erosion caused by illegal vehicles and ensure the unobstructed flow of water through floodplains and streambeds.	No obstruction to water flow through floodplains and streambeds. No action to stop illegal vehicular access, with continued soil damage and erosion.	No obstruction to water flow through floodplains and streambeds. Illegal vehicular access in backcountry areas controlled, reducing damage to soils. Mitigation measures to minimize damage from construction.
Vegetation		
Protect vegetation from damage and destruction caused by illegal roads and cross-country driving. Minimize the amount of exotic vegetation that is introduced during construction activities.	No action to stop illegal vehicular activity, with continued damage to vegetation. No action to control spread of exotic vegetation by means of illegal vehicle traffic.	Illegal vehicular access prevented, although illegal foot traffic would continue. Continual monitoring of disturbed and restored areas to eradicate invasive plants along the border as they colonize; continued illegal foot traffic.
Wildlife, Including Threatened or Endangered Species		
Protect wildlife and habitat from damage and destruction caused by the creation of illegal roads and cross-country driving; ensure the safe and unobstructed passage of wildlife through a wildlife-friendly vehicle barrier fence.	No action to stop illegal vehicular activity, particularly to smuggle undocumented aliens, and unauthorized human presence in wildlife habitat.	Illegal vehicular access prevented, thus reducing noise and human presence in backcountry areas; continued illegal foot traffic.
Protect threatened or endangered species and critical habitat from disturbances caused by human presence and vehicular noise.	No action to stop illegal vehicular activity and human presence, with potential effects on threatened or endangered species.	Illegal vehicular access prevented, reducing noise and human presence in backcountry areas and benefiting threatened or endangered species; continued illegal foot traffic.
Visitor Experience, Use, and Appreciation		
Prevent further impacts to park view-scapes and the creation of illegal cross-country roads. Improve the visitor experience by restoring a more pristine environment.	Continued effects from abandoned vehicles and miles of illegal roads. Abandoned vehicles, damage to natural resources, and creation of miles of illegal roads would continue to damage the pristine environment.	Illegal vehicular access prohibited, allowing road scars to heal and abandoned vehicles to be removed. A more pristine environment restored by allowing road scars to heal, protecting natural resources, and removing abandoned vehicles.
Human Health and Safety		
Enhance visitor and employee safety.	Continued risks to park visitors and employees from illegal activity. No action to stop illegal vehicular access or to reduce high-speed chases.	Increased visitor and employee safety by better controlling drug smuggling. High-speed chases reduced.
Park Management and Operations		
Reduce the need for a substantial increase in law enforcement and maintenance staff and equipment.	More law enforcement staff needed to deal with increased illegal activity, such as drug smuggling.	Illegal activities and vehicular access prevented; reduced need for additional law enforcement staff.
Adjacent Land Agencies		
Work with adjacent land agencies to mitigate the effects of terminating a vehicle barrier at park boundaries, which could cause increased illegal vehicular traffic (and associated impacts) through adjacent lands.	No illegal vehicular traffic rerouted onto adjacent lands.	Cooperative efforts needed with adjacent land management agencies and Tohono O'odham Nation to extend the barrier beyond the park boundary.

Table 3: Summary Comparison of Impacts — Organ Pipe Cactus National Monument		
Impact Topic	Alternative A: No-Action Alternative	Alternative B: Preferred Alternative — Mixed-Style Vehicle Barrier
Floodplains	Continued illegal cross-country travel and driving in washes would disrupt soil conditions, contributing to soil instability and adding to accelerated erosion of streambanks during flash flood events. The existing border patrol road would continue to add to erosion of wash banks at crossings, contributing a negligible adverse impact to drainages and the potential for flooding downstream. The impacts of the no-action alternative, when combined with past and present actions, would contribute a negligible amount of impacts to drainage and hydrology.	Construction and maintenance of a road along the boundary could increase the susceptibility of the watershed to accelerated erosion. Implementing a revegetation plan would help offset potential erosion impacts associated with flooding by stabilizing soils and vegetation on streambanks. Overall, impacts would be localized to certain areas, adverse, long-term, and of minor to moderate intensity. The effect of the barrier fence and associated road on drainages and hydrology, when combined with other past and present actions, would contribute adverse, long-term, and widespread negligible to minor adverse impacts to the regional watershed.
Soils	Continued impacts to soils would be adverse, long term, and moderate due to illegal vehicular activity throughout the monument. Cumulative impacts would be adverse, and long term, moderate.	Impacts to soils related to construction activities would be adverse, short term, and moderate. Impacts as a result of construction and patrol activities would be adverse, long term, and negligible. The vehicle barrier would help protect soils in the rest of the monument from damage caused by illegal vehicles. Therefore, long-term impacts to soils would be beneficial and negligible. Cumulative impacts to soils and erosion would be beneficial, long term, and negligible.
Vegetation	Illegal vehicular use throughout the monument's backcountry would continue to cause adverse, long-term, minor to moderate impacts to all vegetation, including sensitive species. No additional steps would be taken to minimize illegal poaching activities, with adverse, long-term, minor impacts to several unique species. Cumulative impacts would be adverse, long term, and minor to moderate.	Construction activities would result in adverse, short-term, minor impacts to all species, with the exception of the smoke-tree, which would be moderately affected, and the desert tree caper, which would be minor to moderately affected. However, all vegetation (with the exception of the Sonoran night-blooming cactus) would experience beneficial, long-term, moderate impacts due to the reduction of damage to vegetation from illegal vehicular activity throughout the monument's off-road areas. In addition, several unique species within the monument could experience minor to moderate beneficial impacts as a result of reduced poaching. Cumulative impacts to vegetation would be beneficial, long term, and moderate.
Wildlife and Wildlife Habitat	Damage to wildlife habitat and disturbance to wildlife would continue, resulting in adverse, long-term, moderate impacts to all habitats, except those in mountainous areas. Cumulative impacts would be adverse, long term, and negligible to minor.	Impacts from construction activities would be adverse, short term, and minor. Impacts to wildlife from increased protection would be beneficial, long term, and minor to moderate. Cumulative impacts would be beneficial, long term, and minor to moderate.
Threatened, Endangered, and Special Concern Species	Overall, most species would experience adverse, long-term, and minor to moderate impacts. Cumulative impacts would be adverse, long term, minor to moderate.	Overall, most species would experience adverse, short-term, negligible to minor impacts from construction activities, and beneficial, long-term, minor to moderate impacts with a reduction in illegal activities. Cumulative impacts would be beneficial, long term, and moderate.
Visitor Experience, Use, and Appreciation	Adverse, long-term, minor impacts would occur to visitors who expect a pristine, natural environment. The presence of abandoned vehicles and damage to natural resources as a result of illegal vehicle use would result in adverse, long-term, negligible impacts to viewscales. Cumulative impacts to visitor experience would be adverse, long term, and negligible.	A vehicle barrier would result in a beneficial, long-term, minor to moderate impact to visitors who expect solitude and a pristine natural environment. Some visitors would be exposed to adverse, short-term, minor impacts during construction due to noise. Long-term impacts to viewscales from the barrier would be adverse and negligible, because it would not be visible from most of the monument. Some visitors would be exposed to adverse, short-term, minor impacts to viewscales during construction. Cumulative impacts to visitor

Impact Topic	Alternative A: No-Action Alternative	Alternative B: Preferred Alternative — Mixed-Style Vehicle Barrier
		experience would be beneficial, long term, and minor to moderate.
Human Health and Safety	Impacts would be adverse, long term, and moderate. If trends in illegal activity continue as anticipated, long-term impacts would worsen. Cumulative impacts would be adverse, long term, and moderate.	A vehicle barrier would provide beneficial, long-term, moderate impacts to human health and safety by reducing drug smuggling through backcountry areas. Cumulative impacts would be beneficial, long term, and moderate.
Park Management and Operations	Short- and long-term impacts would continue to worsen as increases in staff and funding would be required to track and apprehend drug smugglers, resulting in adverse, long-term, moderate impacts. Cumulative impacts would be adverse, long term, and moderate.	A vehicle barrier would result in beneficial, long-term, moderate impacts to park management and operations. Additional federal funds would continue to be needed to fight drug smuggling that occurs on foot. The number of rangers required to prevent illegal drug activities would continue to increase with rising criminal activity, but not to the degree as under alternative A. Projected additions to maintenance crews would be sufficient to maintain the barrier. Cumulative impacts would be beneficial, long term, and moderate.
Adjacent Lands	Impacts under the no-action alternative from continued illegal vehicle use would be adverse, short and long term, and minor to moderate. Cumulative impacts would be adverse, long term, and minor to moderate.	In the absence of quantifiable data, it is likely that impacts to the Tohono O’odham Reservation and Cabeza Prieta National Wildlife Refuge would be adverse, long term, and minor to moderate. Cumulative impacts would be adverse, long term, and minor to moderate depending on the extent that illegal vehicle traffic from Organ Pipe Cactus was rerouted onto adjacent lands as a result of the vehicle barrier.

Table 4: Summary Comparison of Impacts — Coronado National Memorial

Impact Topic	Alternative A: No-Action Alternative	Alternative B: Preferred Alternative — Mixed-Style Vehicle Barrier
Floodplains	There would be no impacts on the frequency and intensity of flood flows in the drainage systems under the no-action alternative. To the extent that illegal cross-country travel increased in the future, soils and vegetation on undisturbed lands and washes could be loosened, resulting in accelerated erosion. Cumulative impacts would be adverse, long term, and minor to moderate. The no-action alternative would not contribute to cumulative impacts.	The vehicle barrier would have no impacts on the frequency and intensity of flood flows in the drainage systems; any impacts associated with cross-country travel would be eliminated, resulting in beneficial impacts. Adhering to a mitigation plan during construction, revegetating disturbed areas, and following a road maintenance plan would lessen impacts to floodplains. Overall, impacts would be localized to certain areas, adverse, long term, and minor to moderate. Cumulative impacts would be adverse, long term, and minor to moderate; proposed actions would have a negligible contribution to cumulative impacts.
Soils	Impacts to soils could potentially occur from illegal vehicles accessing the memorial, resulting in adverse, long-term, negligible to minor impacts. Cumulative impacts to soils and erosion would be adverse, long term, and negligible to minor.	Impacts to soils related to construction activities would be adverse, short term, and moderate. Impacts to soils from erosion would be adverse, long term, and negligible. Cumulative impacts to soils would be adverse, long term, and negligible to minor.
Vegetation	Illegal vehicular use in the memorial could damage vegetation, resulting in adverse, long-term, negligible to minor impacts. Cumulative impacts would be adverse, long term, and minor.	Impacts to vegetation as a result of construction activities would be adverse, short-term, and negligible. Beneficial, long-term, negligible to minor impacts would result from the potential prevention of illegal vehicular activity in the memorial. Cumulative impacts would be adverse, short-term, and negligible; long-term cumulative impacts to vegetation would be beneficial and minor.
Wildlife and Wildlife	Damage to wildlife habitat and disturbance to wildlife would continue, resulting in adverse, long-term,	Impacts on wildlife and wildlife habitat from construction activities would be adverse, short term, and

Table 4: Summary Comparison of Impacts — Coronado National Memorial

Impact Topic	Alternative A: No-Action Alternative	Alternative B: Preferred Alternative — Mixed-Style Vehicle Barrier
Habitat	negligible to minor impacts to wildlife in the grama species mixed grasses / mixed scrub habitat. Cumulative impacts would be adverse, long term, and minor.	negligible. The potential reduction or prevention of illegal vehicular activity would result in beneficial, long-term, minor impacts. Cumulative impacts would be beneficial, long term, and minor.
Threatened, Endangered, and Special Concern Species	Because no action would be taken to prevent illegal vehicular activity in the memorial, damage to important habitat could occur, resulting in adverse, short- and long-term, negligible to minor impacts. Cumulative impacts would be adverse, long term, and minor.	Overall impacts to threatened or endangered species would be adverse, short-term, and negligible to minor due to construction activities, as well as beneficial, long term, and minor due to increased protection. Cumulative impacts would be beneficial, long term, and minor.
Visitor Experience, Use, and Appreciation	Adverse, short- and long-term, minor impacts would occur to visitors who expect a pristine, natural environment. The presence of abandoned vehicles and damage to natural resources would result in adverse, long-term, negligible impacts to viewscapes. Cumulative impacts to visitor experience would be adverse, long term, and negligible.	The presence of a vehicle barrier would result in beneficial, long-term, minor impacts to visitors who expect a pristine natural environment. Visitors would be exposed to adverse, short-term, negligible impacts during barrier construction. Impacts to viewscapes would be adverse, long term, and negligible because the barrier would not be visible from most of the memorial. Cumulative impacts to visitor experience would be beneficial, long term, and minor.
Human Health and Safety	Impacts would be adverse, long term, and minor to moderate because no additional measures would be taken to prevent illegal vehicular activity in the memorial. Cumulative impacts would be adverse, long term, and negligible.	A vehicle barrier would result in beneficial, long-term, minor impacts to the health and safety of memorial visitors and staff by reducing illegal vehicular activity in the memorial. Cumulative impacts would be beneficial, long term, and moderate.
Park Management and Operations	Current staffing levels are insufficient to adequately address issues related to illegal smuggling. Therefore, impacts would continue to be adverse, long term, and moderate. Cumulative impacts would be adverse, long term, and minor.	A vehicle barrier would result in beneficial, long-term, minor, impacts to park management and operations. No additional maintenance equipment or increases to maintenance staff would be required. Cumulative impacts would be beneficial, long term, and moderate.

**Organ Pipe Cactus National
Monument:
Affected Environment and
Environmental
Consequences**

METHODOLOGY FOR ASSESSING IMPACTS

Potential impacts are described in terms of type (are the effects beneficial or adverse?), context (are the effects site-specific, local, or even regional?), duration (are the effects short term, lasting less than one year; or long term, lasting more than one year?), and intensity (are the effects negligible, minor, moderate, or major?). Definitions of intensity vary by impact topic and are provided separately for each impact topic analyzed in this environmental assessment.

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). These actions were identified, and cumulative impacts were determined by combining the impacts of alternatives with those of the other projects.

Present actions include drug law enforcement staff driving along the border road that parallels the international boundary for patrol purposes. Reasonably foreseeable future actions include the Border Patrol’s plans to further modify the area along the international boundary. Plans that could affect Organ Pipe Cactus National Monument include the following (INS 2002):

- *Installation of a pedestrian barrier from the port of entry extending 1 mile to the east and west* — The Border Patrol would like to implement over the next five years, and it may want to extend the barrier to 2 miles on each side (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002).
- *Replacement of the temporary checkpoint facility on Arizona Highway 85* — The new facility could be within the monument or north of the park on BLM land. It would include pull-outs and possibly lighting to increase safety (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002).
- *Installation of 12-foot-square concrete pads for the placement of mobile LORIScopes* — These portable skywatch towers with cabs extending 25–30 feet high act as a deterrent to illegal entry. No locations have been identified, and no LORIScopes currently exist in the monument. The Border Patrol would place LORIScopes within the 60-foot easement that parallels the international boundary (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002).
- *Replacement of the existing border road that parallels the international boundary within the 60-foot easement with an all-weather road* — The replacement would include bridges, culverts, and small pipes for drainage (if necessary). No schedule has defined. An environmental assessment would be required (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002).

Because of the North American Free Trade Agreement, the Lukeville port-of-entry may open 24-hours a day. Therefore, traffic would constantly flow through the monument on Arizona 85, and rangers would be staffed 24-hours a day. The port-of-entry is currently open daily 6:00 A.M. to midnight (it is not known when the hours may change.)

NPS *Management Policies* require an analysis of potential effects to determine whether or not actions would impair park resources (NPS 2001b). As previously stated, the fundamental purpose of the national park system is to conserve park resources and values for the use and enjoyment of future generations. Park 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 NPS managers the 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. That discretion to allow certain impacts within park 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 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 adverse effect on a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

Impairment may result from NPS activities in managing the park, visitor activities, or activities undertaken by concessioners, contractors, and others operating in the park. A determination on impairment is made in the "Environmental Consequences" section of this document for each natural and cultural resource impact topic.

NATURAL RESOURCES

FLOODPLAINS

AFFECTED ENVIRONMENT

Surface water drainage originates in the mountainous areas north and east of Organ Pipe Cactus National Monument and results in numerous intermittent, braided channels, connecting to larger arroyos or “washes” that drain into Mexico. These washes are well defined and hold runoff from brief but intense summer rainstorms, or other seasonal rainstorms that are typically less intense and longer in duration. Usually runoff quickly infiltrate streambeds, and only rarely is it sufficient to cause flooding in the normally dry washes. No perennial (permanent) rivers or streams exist within the monument (NPS 1995).

Precipitation in the northern Sonoran Desert occurs in two seasons. From November through April storms are regionally widespread, may last up to several days, and are generally of low intensity. From July through September, the “Arizona Monsoon” brings moist, tropical air from the Gulf of Mexico, giving rise to short, intense thunderstorms. Rain falls so rapidly and intensely that infiltration cannot keep up and washes are more likely to flow with water and create flash floods.

The project area includes approximately 40–50 well-defined washes and approximately 100 small, braided channels. A majority of the monument is within the Rio Sonoyta watershed, and all surface waters in the project area flow into the Sonoyta River in Mexico. The largest drainage is the Aguajita Wash, the only officially named wash intersecting the project area. This drainage system includes almost 20,000 acres in the southwestern part of the monument and has the highest potential for flooding. Over half of the drainages have a potential to yield moderate or more severe floods. Seven drainages have a low to moderate relative flooding potential, and eight have the lowest relative flooding potential. Factors that have either directly or indirectly contributed to erosion potential and downcutting of washes include past cattle grazing, illegal off-road driving, and the presence and use of the border patrol road.

No perennial streams cross the U.S.-Mexico border in the affected area. The spring system at Quitobaquito would naturally flow across the boundary, but a historic dam impounds the water in a small pond that has no outlet.

The NPS *Procedural Manual #77-2: Floodplain Management* (NPS 2002e) provides agency-specific guidance for implementing Executive Order 11988, “Floodplain Management.” The guideline reiterates the NPS policy of preserving floodplain values, minimizing potentially hazardous conditions associated with flooding, and adhering to all federal laws and regulations related to activities in flood-prone areas. According to the guideline, an action class and applicable regulatory floodplain must be identified for a proposed action that is either subject to possible harm from flooding or has the potential for adverse floodplain impacts.

A U.S. Army Corps of Engineers section 404 permit would be required prior to construction.

ENVIRONMENTAL CONSEQUENCES

Methodology and Intensity Thresholds

Impact intensities of floodplain impacts were derived from available information and park staff observations on floodplain impacts from past construction activities.

- Negligible:* Floodplains would not be affected, or changes would be either nondetectable or, if detected, would have effects that would be considered slight or local, and would likely be short term.
- Minor:* Changes in floodplains would be measurable, although the changes would be small, would likely be short term, and would be localized. No mitigation measure associated with water quality or hydrology would be necessary.
- Moderate:* Changes in floodplains would be measurable and long term, but would be relatively local. Mitigation measures associated with water quality or hydrology would be necessary, and these measures would likely succeed.
- Major:* Changes in floodplains would be readily measurable, would have substantial consequences, and would be noticed on a regional scale. Mitigation measures would be necessary, and their success would not be guaranteed.
- Impairment:* A major, adverse impact to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing 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 NPS planning documents.

Alternative A: No-Action Alternative

There would be no impacts under the no-action alternative on the frequency and intensity of flood flows in the drainage systems as they cross the international boundary. Continued illegal cross-country travel and driving in washes would continue to disrupt soil conditions, contributing to soil instability and adding to accelerated erosion of streambanks during flash flood events. Impacts resulting from these events would be adverse, long-term, localized, and of minor to moderate intensity. The existing border patrol road would continue to cause erosion of wash banks at crossings, contributing a negligible amount of adverse impacts to drainages and the potential for flooding downstream. Impacts would continue to be long-term, localized in areas, and of negligible to minor intensity.

Cumulative Impacts

Natural processes of erosion and deposition have shaped the patchwork of soil types and topography in the affected area. Livestock grazing beginning in the early 1900s has contributed to accelerated erosion in the vicinity of Dos Lomitas and has caused headcutting and deepening of the Rio Sonoyta channel.

Farmlands in Mexico have beneficial effects on drainages within the monument. Farm fields in Mexico work to mediate headcutting moving upstream towards the U.S. from the Sonoyta River. Retention basins and drainage diversions also exist in the monument and are intended to protect farm fields from flooding.

The impacts of the no-action alternative, when combined with past and present actions, would contribute a negligible amount of impact to drainage and hydrology.

Conclusion

Continued illegal cross-country travel and driving in washes would disrupt soil conditions, contributing to soil instability and adding to accelerated erosion of streambanks during flash flood events. The existing border patrol road would continue to add to erosion of wash banks at crossings, contributing a negligible adverse impact to drainages and the potential for flooding downstream. The impacts of the no-action alternative, when combined with past and present actions, would contribute a negligible amount of impacts to drainage and hydrology.

Because there would be no major, adverse impacts to floodplains, there would be no impairment of park resources or values.

Alternative B: Preferred Alternative

The vehicle barrier would have no impacts on the frequency and intensity of flood flows in the drainage systems as they cross the international boundary, and any impacts associated with illegal cross-country travel would be eliminated. Improving and maintaining a road along the boundary could, however, increase the susceptibility of the watershed to accelerated erosion.

After improvements, the road would be maintained more frequently than it has been in the past. Over the long term grading could cause the road surface to drop below the surrounding wildlands. This impact would occur mostly in deep loamy soils and less so on rocky surfaces. In some cases a lower road could capture runoff during thunderstorms and redirect the runoff to drainages, resulting in some loss of riparian habitat. Impacts would be adverse, long term, and negligible to moderate in intensity, depending on the frequency and intensity of storm events. Implementing the revegetation plan would help offset potential erosion impacts associated with flooding by stabilizing soils and remaining vegetation along streambanks. Overall, impacts would be localized to certain areas, adverse, long term, and minor to moderate in intensity.

In some cases, flood flows could deposit woody debris against the vehicle barrier. However, given the 5-foot width between upright posts of the barrier, accumulation between posts would be unlikely. Nevertheless, debris might need to be cleared after flood events and would need to be considered as part of normal maintenance.

Widening the patrol road could result in the removal of the southern end of a diversion dike east of Dos Lomitas. The dike was built to divert the natural drainage away from a farm field and into a system of constructed channels in Mexico. As portions of this dike are removed or naturally fail, the natural channel will be reestablished, causing some road damage in the U.S. and changing flood patterns in Mexico.

Cumulative Impacts

Floodplains in Organ Pipe Cactus National Monument are the result of thousands of years of soil development. Natural processes of erosion and deposition have shaped the patchwork of soil types and floodplains in the affected area. Livestock grazing beginning in the early 1900s has contributed to accelerated erosion in the vicinity of Dos Lomitas and has caused headcutting and deepening of the Rio Sonoyta channel.

Farmlands in Mexico have beneficial effects on drainages within the monument. Farm fields in Mexico work to mediate headcutting moving upstream towards the U.S. from the Sonoyta River.

Retention basins and drainage diversions also exist in the monument and are intended to protect farm fields from flooding.

The entrenchment of the patrol road may offset some of the benefits of diversion dams and retention basins by deepening the channel beds and re-directing flood flows down the road. Blading the roadbed to maintain a relatively smooth surface will accelerate the downcutting of the road and will add to watershed instability.

The effect of the vehicle barrier and associated road on drainages and hydrology, when combined with other past and present actions, would contribute adverse, long-term, and widespread negligible to minor impacts to the regional watershed.

Conclusion

Construction and maintenance of a road along the boundary could increase the susceptibility of the watershed to accelerated erosion. Implementing a revegetation plan would help offset potential erosion impacts associated with flooding by stabilizing soils and vegetation on streambanks. Overall, impacts would be localized to certain areas, adverse, long-term, and of minor to moderate intensity. The effect of the barrier fence and associated road on drainages and hydrology, when combined with other past and present actions, would contribute adverse, long-term, and widespread negligible to minor adverse impacts to the regional watershed.

Because there would be no major, adverse impacts to floodplains, there would be no impairment of park resources or values.

SOILS

AFFECTED ENVIRONMENT

Soil formation is slow in arid environments. Because chemical decomposition of parent material is hindered by a lack of precipitation, monument soils have minimal profile development. All monument soils are classified as aridosols (hot arid soils). A 1972 soil survey by the Soil Conservation Service identified 16 soil series and one rocky association (Chamberlin 1972).

The upper reaches of the Ajo, Bates, and Puerto Blanco Mountains are composed of rock, and the lower mountain slopes, as well as most lower hills in the monument (such as Quitobaquito and Cipriano Hills), are very stony loam (Chamberlin 1972).

A variety of soil types exist along the international boundary, as shown in Table 5. GIS data was used to determine the amount of acres of each soil type within a 30-foot wide corridor adjacent to the boundary (U.S. Dept. of Agriculture 1972).

Table 5: Soil Types — Organ Pipe Cactus National Monument

Soil Type	Acres	Percent	Erosion Hazard
Saline	2.2	2.0	Unknown
Ajo very gravelly loam, 1-5% slopes	0.9	0.4	Slight
Antho fine sandy loam	2.0	1.8	Slight
Antho fine sandy loam, very gravelly variant	0.4	0.4	Slight
Gilman very fine sandy loam	4.8	4.5	Slight – moderate
Gilman very fine sandy loam, saline	14.3	13.4	Slight – moderate

Soil Type	Acres	Percent	Erosion Hazard
Growler-Antho complex	6.4	6.0	Slight
Gunsight very gravelly loam, 0-2% slopes	4.6	4.3	Slight – moderate
Gunsight very gravelly loam, 2-15% slopes	15.2	14.2	Slight – moderate
Harqua very gravelly loam, 0-3% slopes	1.7	1.6	Slight
Harqua very cobbly loam, 0-8% slopes	1.8	1.7	Slight
Harqua-Gunsight Complex	23.2	21.7	Slight - moderate
Lomitas very stony loam, 8-40% slopes	9.8	9.2	Slight
Perryville very cobbly fine sandy loam, 0-8% slopes	7.1	6.6	Slight
Rock land	4.0	3.8	Slight
Rock outcrop	1.9	1.8	Slight
Torrifluents (wash beds)	6.8	6.4	Not applicable
TOTAL	107.1	99.8	

Although the erosion hazard is slight to moderate on all soil types when they are undisturbed, some are very mobile when disturbed. Evidence of severe accelerated erosion occurs on Gilman and Antho fine sandy loams in the area of Dos Lomitas (NPS 2003a).

Pleistocene Epoch terraces exceeding 10,000 years and even 100,000 years are present within the construction area. These terraces have surface “pavements” of dark-varnished stones and pebbles held together with a matrix of carbonates, overlying up to 40 cm of silt and clay, which overlies fractured rock or caliche. When the stable pavement surface is broken by vehicle traffic, exposing subsurface silts and clays, dust pits are created that are difficult to drive through and difficult to revegetate (S. Rutman, NPS, pers. comm., P. Steinholtz, URS, Feb. 5, 2003). These ruts, called blowouts, are usually 100–200 feet wide and can become so deep that the road cannot be driven (W. Mikus, NPS, pers. comm., P. Steinholtz, URS, Dec. 11, 2002).

Up to 35 turnaround areas totaling approximately 10 acres would be disturbed. Staging and stockpile areas would be approximately 1 acre in size. Up to 16 turnaround areas for heavy equipment would also be used; all but 5 would be on South Puerto Blanco Drive. Two existing connecting roads would be used to access the border from the drive. No wilderness areas would be affected south of South Puerto Blanco Road, and a 150-foot-wide non-wilderness corridor exists on the north side of the road (P. Rowlands, NPS, pers. comm., P. Steinholtz, URS, Jan. 29, 2003).

ENVIRONMENTAL CONSEQUENCES

Methodology and Intensity Thresholds

Impact intensities for soils were derived from the available soils information and park staff observations of the effects on soils from past construction activities.

- Negligible:* The impact would be at the lowest levels of detection and would cause very little or no physical disturbance /removal, compaction, or increased erosion, when compared with current conditions.
- Minor:* The impact would be slight but detectable in some areas, with few perceptible effects of physical disturbance/removal, compaction, or increased erosion of soils.
- Moderate:* The impact would be readily apparent in some areas and would have measurable effects in terms of physical disturbance/removal, compaction, or increased erosion.

Major: The impact would be readily apparent in several areas and would have severe effects in terms of physical disturbance/removal, compaction, or increased erosion.

Impairment: A major, adverse impact to a resource or value whose conservation is (1) necessary to fulfill specific purposes identified in the establishing 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 NPS planning documents.

Impacts of Alternative A: The No-Action Alternative

Under alternative A no action would be taken to prevent illegal vehicle entries from Mexico. Impacts to soils would include compaction, as well as making soils more susceptible to erosion. Continued impacts to soils would be adverse, long term, and moderate.

Cumulative Impacts

Previous and continued driving patrols along the border road have resulted in compacted soils and dust, as well as ruts and blowouts. Future USBP plans in the area (see page 51) could result in adverse, short-term, negligible impacts due to construction activities. Direct impacts to soils could decrease as a result of deterrents planned by the Border Patrol, and planned road improvements could reduce long-term impacts to soils, resulting in beneficial, long-term, negligible impacts.

Under the no-action alternative, impacts would be adverse, long term, and moderate. When combined with reasonably foreseeable future actions, the cumulative impacts would be adverse, long term, and moderate because, even though patrol road improvements could reduce impacts to soils in that location, no direct measures would be taken to protect soils in the rest of the monument.

Conclusion

Continued impacts to soils would be adverse, long term, and moderate due to illegal vehicular activity throughout the monument. Cumulative impacts would be adverse, long term, and moderate.

Because there would be no major, adverse impacts to soils, there would be no impairment of related park resources or values.

Impacts of Alternative B: The Preferred Alternative

The project area of disturbance would be approximately 30 feet wide and 30 miles long, for a total of approximately 109 acres. Of that area, approximately 43.6 acres have already been disturbed, in the form of a 12-foot-wide Border Patrol access road within the 60-foot boundary easement. The barrier would be constructed approximately 3 feet north of the existing fence. The border road would need to be widened by approximately 3 to 5 feet. This new road profile would be maintained in order to provide access by heavy equipment to repair the barrier.

Removing topsoil, mixing soil layers, compacting the soil, destroying soil structure, and disrupting soil crusts are aspects of construction projects that could adversely affect long-term prospects for site restoration. When heavy vehicles drive on soil surfaces, they collapse pores and compact soil particles. This creates adverse growing conditions for desert plants, many of which require above-average amounts of soil oxygen. Exposing deep soil layers or mixing layers can inhibit germination or

establishment of many native species. Until plant cover is restored, accelerated erosion can occur on disturbed sites, resulting in long-term damage (S. Rutman, NPS, pers. comm., P. Steinholtz, URS, Feb. 5, 2003).

Excavated material would also be susceptible to erosion, but the amount of soil excavated would be minimal because post holes would be dug to support the barrier rather than a trench. The top 6 to 8 inches of soil would be removed and stored in staging and turnaround areas (S. Rutman, NPS, pers. comm., P. Steinholtz, URS, Feb. 5, 6, 2003). Salvaged surface soils would be returned to the disturbed site, and seeds of vascular and non-vascular plants would be replaced. Salvaged soils contain the inoculants needed to rebuild vital soil crust micro-organisms, such as fungi and cyanobacteria (S. Rutman, NPS, pers. comm., P. Steinholtz, URS, Feb. 5, 2003).

The majority of the soils in this area (approximately 65%) have a slight erosion hazard (see Table 5). If affected, the area near Dos Lomitas Ranch would require additional attention, as defined in the road maintenance plan. Minor amounts of dust could also be generated by 24-hour security personnel assigned to protect materials from theft or vandalism. Impacts to soils from erosion would be adverse, short term, and minor. However, activity would be confined to the 60-foot easement that parallels the border for patrol and protection purposes and turnaround areas.

Special attention would be given to wash crossings and culverts in these areas, as defined in the road maintenance plan. In addition, 24-hour security personnel assigned to protect materials from theft or vandalism would also contribute to compaction. Impacts related to construction activities would be restricted to the 30-foot-wide construction area along the boundary and would be adverse, short term, and moderate. Long-term impacts related to compaction along the patrol road would be adverse and negligible. However, the vehicle barrier would provide protection to soils in the rest of the monument from damage caused by illegal vehicle use. Therefore, long-term impacts to soils would be beneficial and negligible.

Cumulative Effects

Previous and continued patrols along the border road have resulted in compacted soils and dust, as well as ruts and blowouts. Future USBP plans in the area (see page 51) could result in adverse, short-term, negligible impacts due to construction. However, impacts to soils could decrease as a result of deterrents planned by the Border Patrol, and planned patrol road improvements could reduce impacts to soils in that area, resulting in beneficial, long-term, negligible impacts.

Under alternative B, impacts would be beneficial, long term, and negligible. When combined with reasonably foreseeable future actions, the cumulative impacts would be beneficial, long term, and negligible.

Conclusion

Adverse, short-term, moderate impacts to soils from construction activities would occur under this alternative. Impacts as a result of patrol activities along the road would be adverse, long term, and negligible. The vehicle barrier would help protect soils in the rest of the monument from damage caused by illegal vehicle use. Therefore, long-term impacts to soils would be beneficial and negligible. Cumulative impacts to soils and erosion would be beneficial, long term, and negligible.

Because there would be no major, adverse impacts to soils, there would be no impairment of related park resources or values.

VEGETATION

AFFECTED ENVIRONMENT

Surveys have identified 574 vascular species within the monument, representing 325 genera and 87 families of both perennial and annual plants (Bowers 1980; Pinkava et al. 1992). Approximately 64 species (11%) are nonnative (Felger 1990). The monument’s location in the approximate geographic center of the Sonoran Desert is a place where the subdivisions of the Sonoran Desert intergrade. This ecotone contributes to the diversity of desertscrub vegetation and accounts for approximately 95% of the monument’s area (Warren et al. 1981). Mesic vegetation exists only in riparian areas and at higher elevations.

At least 29 vegetative associations occur within the monument, and they have been grouped into biotic communities. These include mixed Sonoran desertscrub, creosotebush / bursage, evergreen woodland / mesic evergreen scrubland, marsh and open water, and riparian communities (Groschupf et al. 1988). Table 6 shows the associations and four biotic communities within 30 feet of the international boundary.

Table 6: Biotic Communities and Vegetation Associations along the U.S.-Mexico Border, Organ Pipe Cactus National Monument

Biotic Communities	Association	Acres	Per-centage
Mixed Sonoran Desertscrub	<i>Atriplex polycarpa</i> / <i>A. linearis</i> / <i>Prosopis velutina</i>	10.51	9.8
Mixed Sonoran Desertscrub	<i>Atriplex polycarpa</i> / <i>A. linearis</i> / <i>Suaeda moquinii</i>	1.07	1.0
Riparian	<i>Acacia</i> / <i>Ambrosia ambrosioides</i>	1.77	1.6
Mixed Sonoran Desertscrub	<i>Ambrosia deltoidea</i> / <i>Parkinsonia microphylla</i> middle bajada	19.97	18.6
Mixed Sonoran Desertscrub	<i>Ambrosia deltoidea</i> / <i>Parkinsonia microphylla</i> pediment mixed shrub	2.81	2.6
Mixed Sonoran Desertscrub	<i>Atriplex polycarpa</i> / <i>A. linearis</i> - <i>Larrea divaricata</i> ssp. <i>tridentata</i>	30.10	28.0
N/A	Bare ground	0.07	0.1
Mixed Sonoran Desertscrub	<i>Parkinsonia microphylla</i> / <i>Encelia</i> / <i>Ambrosia deltoidea</i>	3.80	3.5
Mixed Sonoran Desertscrub	<i>Parkinsonia microphylla</i> / <i>Encelia</i> / <i>Stenocereus</i> / <i>Bursera</i>	3.30	3.1
Mixed Sonoran Desertscrub	<i>Parkinsonia microphylla</i> / <i>Encelia</i> / <i>Stenocereus</i> / <i>Jatropha</i>	6.37	5.9
Riparian	<i>Distichlis spicata</i> / <i>Juncus</i> / mixed herb	0.26	0.2
Riparian	<i>L. divaricata</i> ssp. <i>tridentata</i> / <i>Prosopis velutina</i> floodplain // <i>Acacia-Ambrosia ambrosioides</i>	1.87	1.7
Riparian	<i>L. divaricata</i> ssp. <i>tridentata</i> / <i>Prosopis velutina</i> floodplain	0.81	0.7
Creosotebush / Bursage	<i>Larrea divaricata</i> ssp. <i>tridentata</i> / <i>Ambrosia deltoidea</i> / <i>Fouquieria splendens</i>	7.47	7.0
Creosotebush / Bursage	<i>Larrea divaricata</i> ssp. <i>tridentata</i> / <i>Ambrosia dumosa</i>	0.79	0.7
Creosotebush / Bursage/ Riparian	<i>Larrea divaricata</i> ssp. <i>tridentata</i> / <i>Ambrosia</i> mixed scrub // <i>L. divaricata</i> ssp. <i>tridentata</i> / <i>Prosopis velutina</i> floodplain	3.82	3.6
Mixed Sonoran Desertscrub	<i>Larrea divaricata</i> ssp. <i>tridentata</i> / <i>Ambrosia</i> mixed scrub	6.84	6.4
N/A	Lukeville area development	1.81	1.7
Riparian	<i>Prosopis glandulosa</i> riparian woodland	2.81	2.6
Marsh and Open Water [true? Or riparian?]	<i>Typha domingensis</i> / <i>Scirpus americanus</i>	0.34	0.3
N/A	Unknown	0.77	0.7
Total		107.36	99.8

Of the three biotic communities that exist within the area of proposed action, the mixed Sonoran desertscrub represents the majority (70%), followed by creosote-bursage (18%), and riparian (7%). Prominent desertscrub species include paloverde (*Cercidium* spp.), organ pipe (*Stenocereus thurberi*)

and saguaro (*Carnegiea gigantea*) cactus, ocotillo (*Fouquieria splendens*), bursage (*Ambrosia* spp.), and brittlebush (*Enceliafarinosa*). Small amounts of creosotebush (*Larrea tridentata*) are interspersed among the cacti. Saltbush (*Atriplex* spp.) is also prevalent where heavy, silty, and saline soils occur (NPS 1995).

The creosotebush / bursage community includes creosotebush, triangle-leaf bursage (*Ambrosia deltoidea*), and white bursage (*A. dumosa*). Other associated plants include paloverde, cacti, and seasonal grasses. A small section of this community exists adjacent to Quitobaquito, near the international border.

The vegetation in the area near Aguajita Springs has developed into a riparian woodland. Aguajita Springs is just a few yards north of the international boundary and south of the South Puerto Blanco Road.

A unique assemblage of plants and animals occurs within 0.1 mile of Aguajita Springs and the international boundary. When surface water is present, the site supports emergent aquatic species such as bulrush (*Scirpus americanus*) and cattail (*Typha domingensis*). The local area has a dense canopy of large trees, including desert caper (*Capparis atamisquea*), gray thorn (*Ziziphus obtusifolia*) and mesquite (*Prosopis velutina*). The monument's only population of smoke tree (*Psoralea arguta*), a species near the western limit of its range in the United States, also exists in this area (NPS 2003a).

A thin alluvial aquifer under Aguajita Wash supplies the water for more than five natural springs and seeps in the Quitobaquito Hills region (Carruth 1996). These springs support unique plant and animal life (NPS 2003c).

Species representative of adjacent vegetation types are frequently associated with the riparian community. Small trees and dense shrub thickets line the open, sandy, wash channels. Dominant species include canyon ragweed, foothill paloverde (*C. microphyllum*), creosotebush, catclaw acacia, wolfberry (*Lycium* spp), and ironwood trees (*Olneya tesota*) (Warren et al. 1981).

Ironwood trees, which may live over 1,000 years, provide important services to the ecosystem, such as improving carbon and nitrogen in the soil, "nursing" other plant species, and providing roosts, food, and cover for desert animals. The federally endangered cactus ferruginous pygmy-owl seems to prefer territories having significant ironwood cover (NPS 2003a).

Dense vegetation along the border just south of the Quitobaquito area consists primarily of velvet mesquite, hackberry, whitethorn acacia, and some wolfberry. Numerous human-caused fires are set in this area.

Unique Species

Based on information gathered from the field and botanists familiar with the monument's flora, 27 species have been identified as either rare or sensitive (Johnson et al. 1991). Two of these exist along a 30-foot wide corridor adjacent to the international boundary: the Sonoran night-blooming cactus (*Peniocercus striatus*) and the desert tree caper (*Capparis atamisquea*) (NPS 2003a). In 2002 a survey of part of the habitat at the monument located only 151 Sonoran night-blooming cactus specimens (Anderson and Rutman 2002). Quitobaquito basin and Aguajita Wash contain the only population of the desert tree caper in the United States, with fewer than 100 plants. Leaves of desert caper are the only known food for larvae of Howarth's giant white butterfly (*Ascia howarthi*).

Many species of native flora are of particular concern because they are locally rare or are of interest to poachers and collectors. Cacti of greatest interest include the saguaro, organ pipe, senita, acufia, barrel (*Ferocactus* spp.), and dahlia-rooted cereus (*Cereus striata*). Other native species of value on the black market include shrubs, trees, and succulents that are either rare or are desirable for landscaping. Poaching of locally rare species may not only result in a loss to the monument's botanical diversity, but also adversely affect its biotic relationships (NPS 1995).

The Arizona Native Plant Law protects wild-growing native plants from theft and vandalism through an active public education and enforcement program (Arizona Department of Agriculture 1993). It also provides additional legal protection for the monument's flora.

Nonnative Vegetation

The low percentage (11%) of nonnative species is indicative of a healthy habitat (Felger 1990). However, this figure may actually be lower than reported because some nonnative species (1) may actually be native, (2) are no longer present, (3) are not capable of reproducing or propagating, or (4) are undocumented in the monument despite occurring on adjacent lands. Just over half of all nonnative species have been documented at Quitobaquito Springs, showing the major vegetation changes that have occurred at this location due to human influence (NPS 1995).

Most nonnative plants are colonizing species that occur in disturbed habitats, such as roadsides and developed areas. Several invasive species have become well established in natural habitats and are currently a major problem. Buffel grass (*Pennisetum ciliare*), blue panic (*Panicum antidotale*) and ice plants (*Mesembryanthemum* spp.) pose the most substantial threat, but other species are also problematic (NPS 2003a).

ENVIRONMENTAL CONSEQUENCES

Methodology and Intensity Thresholds

All available information on known vegetation in the monument was compiled. Where possible, information from field studies and observations of exotic species were compared with the area along the international border. Predictions about short- and long-term site impacts were based on previous studies of impacts to vegetation in the park. The thresholds of change for the intensity of an impact are defined as follows:

- 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 a large number of individuals of a species or resource. The change would be measurable and would result in a severely adverse or major beneficial impact, and a possible permanent consequence, on 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 establishing 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 NPS planning documents.

Impacts of Alternative A: The No-Action Alternative

Under alternative A illegal poaching would continue. Because transporting vegetation across the border for illegal sale is easier by vehicle than on foot, several unique species within the monument would be subject to adverse, long-term, minor impacts as a result of continued poaching.

No invasive species would enter the area by means of construction equipment. However, invasive species could continue to be transported into the monument on the illegal vehicles from Mexico. Impacts to native vegetation from the introduction or spread of nonnative species would be adverse, long term, and negligible.

Cattle frequently enter the monument from Mexico to graze on the park's more abundant food sources. This illegal grazing activity occurs near an old ranch and involves approximately 20–30 cows, which enter through breeches in a livestock fence. Volunteers routinely round up the animals and herd them back to Mexico (R. Stinson, pers. comm., P. Steinholtz, URS, Jan. 29, 2003). Under this alternative no additional effort would be made to prevent Mexican cattle from entering the monument.

Adverse, long-term, minor to moderate impacts to all vegetation, including sensitive species, would result from continued damage caused by illegal vehicular use in the monument's backcountry.

Cumulative Impacts

Future USBP plans (see page 51) could have adverse, short-term, negligible to minor adverse impacts on vegetation due to construction activities, depending on the mitigation measures that were implemented (such as a revegetation plan). Beneficial, long-term impacts could result if these projects decreased the amount of illegal entry into the monument and damage to its vegetation. However, none of these projects would prevent illegal vehicles from entering the monument, resulting in adverse, long-term, but negligible impacts.

Under the no-action alternative impacts would be adverse, long term, and minor to moderate. When combined with reasonably foreseeable future actions, cumulative impacts would be adverse, long term, and minor because no direct measures would be taken to protect vegetation.

Conclusion

Adverse, long-term, minor to moderate impacts to all vegetation, including sensitive species, would result from continued damage by illegal vehicular use in the monument's backcountry. No additional steps would be taken to minimize illegal poaching activities; therefore, several unique species within the monument could be subject to adverse, long-term, minor impacts. Cumulative impacts would be adverse, long term, and minor.

Because there would be no major, adverse impacts to vegetation, there would be no impairment of park vegetation resources or values.

Impacts of Alternative B: The Preferred Alternative

Impacts to vegetation during construction would be minimized by locating construction staging areas where vegetation is minimal, reducing the width of the construction area, and salvaging and replanting species that would be removed during construction elsewhere within the monument according to the revegetation plan.

Under mitigation planned for this alternative, no digging or blasting would occur near the Aguajita aquifer without the approval of a qualified geohydrologist. This would help ensure that the flow of water along fractures in the granite underlying the aquifer would not be disrupted. In addition, construction methods that would minimize disturbance.

Mitigation proposed under this alternative requires that disturbed and restored areas be continually monitored to eradicate invasive plants along the border as they colonize, and the road maintenance plan would define procedures for reducing the introduction of invasive species by means of construction equipment. Impacts to native vegetation from the introduction or spread of nonnative species would be adverse, short term, and negligible.

Clearing the vegetation that exists south of Quitobaquito along the border would create a firebreak, resulting in a beneficial impact. Human-caused fires are frequently set in this area, which could have detrimental effects on local natural resources in the area. This vegetation consists primarily of velvet mesquite, hackberry, whitethorn acacia, and some wolfberry.

The monument's only population of smoke tree would be disturbed by construction impacts, likely resulting in adverse, short-term, minor to moderate impacts. Ironwood trees, which exist in riparian areas and provide habitat for the ferruginous pygmy-owl, would also be adversely impacted. However, only 7% of the area along the border is riparian, and two large washes (Growler Wash near Bates Well and Kuajatch Wash near Wall's Well) that are also classified as riparian are farther away and would not be affected.

The presence of a vehicle barrier may reduce impacts to unique vegetation from illegal poaching. Transporting vegetation across the border for illegal sale would be more difficult on foot than by vehicle.

No staging areas would be located in areas of Sonoran night-blooming cactus in order to help reduce impacts to this species. In addition, plants would be salvaged and replanted elsewhere within the monument according to the revegetation plan. However, because of the small numbers of this species and its proximity to the border, impacts to the Sonoran night-blooming cactus would be adverse, short and long term, and minor.

Construction activities would result in adverse, short-term, minor impacts to all species, with the exception of the smoke tree and the desert tree caper, which would experience adverse, moderate impacts. Only 10% of the monument's population of desert tree caper is expected to be impacted (S. Rutman, pers. comm., P. Steinholtz, URS, Feb. 12, 2002), and this species exists in several areas south of the monument.

The presence of a vehicle barrier would prevent cattle from entering the monument from Mexico and trampling and destroying vegetation, resulting in a beneficial, long-term, negligible impact to vegetation in an isolated area.

In summary, all vegetation (except for the Sonoran night-blooming cactus) would experience beneficial, long-term, moderate impacts due to the reduction of damage from illegal vehicular use in

the monument's backcountry. In addition, several unique species within the monument could experience minor to moderate beneficial impacts as a result of reduced poaching.

Cumulative Effects

Future USBP plans (see page 51) could have adverse, short-term, negligible to minor impacts to vegetation due to construction activities, depending on mitigation (such as a revegetation plan). However, increased protection of resources would result in beneficial, long-term, negligible impacts. Under alternative B impacts would be beneficial, long term, and moderate. When combined with reasonably foreseeable future actions, the cumulative impacts would be beneficial, long term, and moderate.

Conclusion

Construction activities would result in adverse, short-term, minor impacts to all species, with the exception of the smoke tree, which would experience moderate impacts, and the desert tree caper, which would experience minor to moderate impacts. However, all vegetation (with the exception of the Sonoran night-blooming cactus) would experience beneficial, long-term, moderate impacts due to reduced damage from illegal vehicular use throughout the monument's backcountry. In addition, several unique species within the monument could experience beneficial, minor to moderate impacts as a result of reduced poaching. Cumulative impacts to vegetation would be beneficial, long term, and moderate.

Because there would be no major, adverse impacts to vegetation resources or values, there would be no impairment of this resource.

WILDLIFE

AFFECTED ENVIRONMENT

Mammals

Of the 55 mammalian species known to occur within the monument, most are nocturnal, and many hibernate during the winter months (November through March). Included in this assemblage are 19 rodents, 13 carnivores, 14 bats, 5 ungulates, 3 rabbits and hares, and 1 insectivore. Nine additional species, most of which are bats, are suspected to occur (Petryszyn 1991). The most common species are shown in Table 7. Threatened, endangered, or special concern species are discussed beginning on page 70.

Table 7: Common Mammals — Organ Pipe Cactus National Monument

Arizona Pocket Mouse	<i>Perognathus amplus</i>
Badger	<i>Taxidea taxus</i>
Big Brown Bat	<i>Eptesicus fuscus</i>
Black-Tailed Jackrabbit	<i>Lepus californicus</i>
Bobcat	<i>Lynx rufus</i>
Cactus Mouse	<i>Peromyscus eremicus</i>
California Leaf-Nosed Bat	<i>Macrotus californicus</i>
California Myotis	<i>Myotis californicus</i>
Collared Peccary	<i>Dicotyles tajacu</i>
Coues White-Tailed Deer	<i>Odocoileus virginianus couesi</i>
Coyote	<i>Canis latrans</i>

Desert Bighorn	<i>Ovis canadensis mexicana</i>
Desert Cottontail	<i>Sylvilagus audubonii</i>
Desert Pocket Mouse	<i>Chaetodipus penicillatus</i>
Gray Fox	<i>Urocyon cinereoargenteus</i>
Harris' Antelope Squirrel	<i>Ammospermophilus harrisi</i>
Merriam's Kangaroo Rat	<i>Dipodomys merriami</i>
Mountain Lion	<i>Felis concolor</i>
Mule Deer	<i>Odocoileus hemionus crooki</i>
Pallid Bat	<i>Antrozous pallidus</i>
Rock Pocket Mouse	<i>Chaetodipus intermedius</i>
Rock Squirrel	<i>Spermophilus variegatus</i>
Round-Tailed Ground Squirrel	<i>Citellus tereticaudus</i>
Sonoran Pronghorn	<i>Antilocapra americana sonoriensis</i>
Western Pipistrelle	<i>Pipistrellus hesperus</i>
White-Throated Wood Rat	<i>Neotoma albigula</i>

SOURCE: Southwest Parks and Monuments Association 1985.

Birds

Of the 277 reported species (Groschupf et al. 1988), 58 are probable breeders and include 36 permanent residents and 22 summer residents. The remaining species are either spring and fall migrants (60 species), vagrants (50 species), or winter visitors.

Surface water can attract thousands of birds daily during the driest periods of the year, particularly at Quitobaquito, with its open water habitat and lush riparian vegetation. Among those species most strongly drawn to open water are mourning doves (*Zenaida macroura*), white-winged doves (*Z. asiatica*), Gambel's quail (*Callipepla gambelii*), and house finches (*Carpodacus purpureus*). The Quitobaquito's waters are approximately 200 feet north of the border and are outside the area of proposed action (see mitigation proposed under alternative B).

Of the 10 species that have colonized the monument since the early 1900s, the rock dove (*Columba livia*), European starling (*Sturnus vulgaris*), and house sparrow (*Passer domesticus*) are all nonnative species that have become common permanent residents in developed areas. The bronzed cowbird (*Molothrus aeneus*) is a common summer resident in riparian and developed areas, and the black vulture (*Coragyps atratus*) is regularly seen near Lukeville. Both species are known to breed within the monument (Groschupf et al. 1988).

Amphibians and Reptiles

The monument's diverse herpetofauna includes 25 snake, 16 lizard, 5 toad, and 2 turtle species. Represented in this assemblage are obligate desert species, riparian species, and species with broad ecological distributions that include non-desert habitats (Lowe and Rosen 1992).

Snake species are generally abundant and widely distributed, although the following species have experienced significant population declines at the monument over the last 50 years: spotted leaf-nosed snake (*Phyllorhynchus decurtatus*), saddled leaf-nosed snake (*P. brownii*), glossy snake (*Arizona elegans*), and sidewinder (*Crotalus cerastes*) (Lowe and Rosen 1992). Roads, particularly if paved, can negatively impact snake populations, and two species — the Mexican rosy boa (*Lichanura trivirgata*) and the Organ Pipe shovel-nosed snake (*Chionactis palarostris*) — have suffered significant highway mortality. Both species are also targeted by collectors, as is the tiger rattlesnake (*C. tigris*).

Four of the monument's five toad species (Couch's spadefoot toad [*Scaphiopus couch*], Colorado River toad [*Bufo alvarius*], Great Plains toad [*B. cognatus*], and red-spotted toad [*B. punctatus*]) are

abundant and breed successfully within the monument. The majority of breeding areas includes surface water sites that have been human-made or modified. Toads also breed successfully in smaller numbers at naturally occurring tinajas and springs throughout the monument (NPS 1995).

Invertebrates

The only known U.S. population of the Mexican leaf-cutting ant (*Alta mexicana*) exists at the monument (Kingsley 1992). At least one Mexican leafcutter ant colony would be affected by installation of a vehicle barrier.

Aguajita Springs and Quitobaquito contain the only known U.S. breeding habitat of Howarth's giant white butterfly (*Ascia howarthi*), which is dependent on the locally rare desert tree caper (*Atamisquea emarginata*) for its larval food (Kingsley 1992). Howarth's giant white butterfly and desert tree caper exist only in the dense thickets associated with Aguajita Springs.

ENVIRONMENTAL CONSEQUENCES

Methodology and Intensity Thresholds

All available information on known wildlife was compiled. Predictions about short- and long-term site impacts were based on existing data from Organ Pipe Cactus National Monument. The thresholds of change for the intensity of an impact are defined as follows:

- 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 would be 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 of a species or resource. The change would be measurable and would result in a severely adverse or major beneficial impact, and possible permanent consequence, on 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 establishing 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 NPS planning documents.

Impacts of Alternative A: The No-Action Alternative

Under alternative A no additional action would be taken to prevent vehicles from illegally entering the monument from Mexico. Continued damage to habitat and disturbance to wildlife caused by illegal vehicle use in the monument's backcountry would result in adverse, long-term, moderate impacts to wildlife. Impacts would occur primarily in the mixed Sonoran desertscrub habitat, which comprises the majority of habitat along the border.

Long-term impacts to wildlife habitat from the introduction or spread of nonnative species would continue to be adverse, long term, negligible to minor. Invasive species could continue to enter the monument on the illegal vehicles crossing from Mexico.

The existing border fence would continue to be a barrier to the movement of large mammals, creating adverse, long-term, minor impacts to wildlife movement.

There would be adverse, long-term, negligible impacts on some species targeted by collectors as a result of continued poaching because transporting animals across the border is easier by vehicle than on foot.

Overall, impacts to wildlife under this alternative would be adverse, short and long term, negligible to minor.

Cumulative Impacts

Future USBP plans in the area (see page 51) could result in adverse, short-term, negligible impacts due to construction activities. However, increased protection of resources would result in beneficial, long-term, negligible impacts. Under the no-action alternative, impacts would be adverse, long term, and negligible to minor. When combined with reasonably foreseeable future actions, the cumulative impacts would be adverse, long term, and negligible to minor because no direct measures would be taken to protect wildlife.

Conclusion

Damage to wildlife habitat and disturbance to wildlife would continue, resulting in adverse, long-term, moderate impacts to all habitats, except mountainous areas. Cumulative impacts would be adverse, long term, negligible to minor.

Because there would be no major, adverse impacts to wildlife or wildlife habitat, there would be no impairment of park resources or values.

Impacts of Alternative B: The Preferred Alternative

The proposed action would result in the permanent loss of approximately 67.4 acres of wildlife habitat (NPS 2003c). Wildlife that depend on the mixed Sonoran desertscrub habitat are most likely to be affected because this habitat is the largest along the border. The wildlife habitat that would be affected exists extensively in Arizona, and impacts would not result in any substantial reduction of the breeding opportunities for birds and other animals on a regional scale.

During construction most wildlife in the affected area would move to surrounding areas. Small mammals and reptiles could be killed during construction. If vegetation was cleared during the nesting season of migratory birds, loss of nests and eggs and mortality of nestlings could occur. Construction activities would cause noise and dust, which would also interrupt foraging and breeding activities of birds and other animals near the construction site. At least one colony of the Mexican leafcutter ants would be traversed by the project (T. Tibbitts, pers. comm., P. Steinholtz, URS, Jan. 15, 2003).

Reducing illegal vehicular use in the monument's backcountry, which would help protect wildlife habitat and reduce noise and dust, would result in beneficial, long-term, moderate impacts; impacts

would be greatest for nocturnal species, since most illegal vehicular activity occurs at night. A vehicle barrier would help reduce the poaching of some species targeted by collectors because transporting animals is easier by vehicle than on foot; this would result in beneficial, long-term, negligible impacts.

Because the Quitobaquito area is outside the impact area, no loss of open water, marsh, or riparian habitats is expected. Noise and dust from construction activity near Quitobaquito would likely disturb wildlife, especially birds. Depending on the timing of construction in this area, some breeding birds and neotropical migrants could be temporarily flushed. Adverse, short term, negligible to minor impacts would occur from construction-related disturbance to wildlife in the Quitobaquito and Aguajita Springs areas.

Clearing the mesquite tree canopy and dense scrub along the border near Quitobaquito during construction would create a firebreak, which would slow any human-caused fires in this area and result in a beneficial, long-term, minor impact.

Because the Quitobaquito Springs and pond area are extremely sensitive and contain some of the monument's most important wildlife resources, mitigation measures would be followed to further protect this area, as described under alternative B on page 30.

Design techniques would reduce adverse impacts on wildlife by placing horizontal rails 36 inches above the ground, which is higher than the lowest wire on most wildlife friendly livestock fences. In those areas where a livestock fence would remain, a smooth lower wire would be placed no less than 18 inches above the ground. Wildlife would be able to pass under the rails or smooth wire unharmed. The proposed barrier would create less of a hindrance to the movement of large mammals than the existing fence, resulting in a beneficial, long-term, minor impact.

Impacts to Howarth's giant white butterfly would be adverse, short-term, and moderate. Only 10% of the monument's population of desert tree caper (upon which the butterfly depends) is expected to be impacted (S. Rutman, pers. comm., P. Steinholtz, URS, Feb. 12, 2002), and both the tree and the butterfly exist in several areas south of the monument.

Overall, impacts from construction would be adverse, short term, and minor. Increased protection to wildlife provided by a vehicle barrier would result in beneficial, long-term, and minor to moderate impacts. (Potential impacts to the Quitobaquito pupfish, lesser long-nosed bat, Sonoran pronghorn, and cactus ferruginous pygmy-owl, and other sensitive species are presented under "Threatened, Endangered, and Sensitive Species.")

Cumulative Effects

Future USBP plans in the area (see page 51) could result in adverse, short-term, negligible impacts due to construction. However, increased protection of resources would result in beneficial, long-term, negligible impacts. Under alternative B, impacts would be beneficial, long term, and minor to moderate. When combined with reasonably foreseeable future actions, the cumulative impacts would be beneficial, long term, minor to moderate.

Conclusion

Impacts to wildlife during construction would be adverse, short term, and minor. Once the vehicle barrier was in place, impacts would be beneficial, long term, and minor to moderate because habitat

protection would be increased. Cumulative impacts would be beneficial, long term, and minor to moderate.

Because there would be no major, adverse impacts to wildlife or wildlife habitat, there would be no impairment of park resources or values.

THREATENED, ENDANGERED, AND SENSITIVE SPECIES

AFFECTED ENVIRONMENT

Management of threatened or endangered species must be consistent with all applicable laws, regulations, and policies, including the Endangered Species Act (1973), the NPS Organic Act (1916), and NPS *Management Policies* (NPS 2001b). At Organ Pipe Cactus, all monitoring programs and management actions directed at these species are coordinated with the U.S. Fish and Wildlife Service and the Arizona Game and Fish Department (AGFD). This includes preparing biological assessments for any actions that may affect federally protected species, as well as obtaining annual permits to monitor these populations.

According to NPS *Management Policies*, park managers are required (1) to identify and promote the conservation of all federally listed endangered, threatened, and candidate species and their critical habitats within park boundaries; and (2) to identify all species inhabiting or native to a national park system unit that are either state or locally listed as endangered, threatened, candidate, sensitive, rare, or declining, along with their critical habitats. These species and their critical habitats must not be adversely affected by park operations or activities external to park boundaries.

Based on information provided by the U.S. Fish and Wildlife Service and the Arizona Game and Fish Department, and supplemented by field observations, 27 threatened, endangered, and candidate wildlife species are known to occur within the monument. Many of these species occur at Quitobaquito or Aguajita Springs. The subsurface aquifer of Aguajita Wash provides water for more than five springs and seeps in the Quitobaquito area. While all of these springs and the Aguajita aquifer are hydrologically linked, only Quitobaquito and Dripping Springs are perennial; the other springs are intermittent and have been mostly dry for several years during the current drought. Although Quitobaquito exists very close to the international boundary, the springs and pond are approximately 200 feet north of the border and outside the area of impacts (NPS 2003c). Also see the mitigation planned for this area under alternative B (see page 31).

Threatened or Endangered Species

Mammals

Sonoran Pronghorn. The endangered Sonoran pronghorn (*Antilocapra americana sonoriensis*) lives in desertscrub habitats within the monument and on adjacent lands, including the Cabeza Prieta National Wildlife Refuge, Barry M. Goldwater Air Force Range, El Pinacate Y el Gran Desierto de Altar, and possibly portions of the Tohono O'odham Reservation. Pronghorn inhabit broad alluvial desert valleys, bajadas, and to a lesser extent foothills in southwestern Arizona. They are present in the monument year-round and tend to occupy valley floor areas in winter, then move upslope into bajadas in spring and summer, when there is likely an increase in numbers (NPS 2001a, 2003c). Pronghorn fawns are born January through March on the valley floors, for example, in the western areas of the monument and the neighboring wildlife refuge.

The Sonoran pronghorn range is divided into two, possibly three, subpopulations by a combination of busy roadways and fences. The U.S. population is separated from the Mexican population by Mexico Highway 2 and the international boundary fence. The Mexican population is likely further subdivided by Highway 8. In the United States, Sonoran pronghorn no longer or rarely occur east of Arizona 85, although suitable habitat does exist east of the highway. Sonoran pronghorn do not easily cross busy paved roadways. Fences are also barriers to movement, and they probably confound movements in areas enclosed by major roadways. Pronghorn generally prefer to go beneath fences, rather than leap or climb over them; they are reluctant to go underneath the standard livestock fence, which has a barbed bottom wire, often fairly close to the ground (NPS 2001a).

Habitat loss is a potential impact on the Sonoran pronghorn. The loss or modification of habitat may be caused by permanent human developments, roads, trails, or other areas cleared of vegetation, invasion by nonnative plants, and modification of plant communities. (NPS 2001a). Disturbance is one of the more common and severe forms of stress on the Sonoran pronghorn. In proximity to humans on foot or in vehicles, pronghorn will move away. Pronghorn may be disturbed by recreation, ground management activities, vehicles, and aircraft. Currently, pronghorn do not approach the border due to the existing high levels of human activity (e.g., Highway 2, human activity in Sonoyta valley) (T. Tibbitts, pers. comm., P. Steinholtz, URS, Jan. 13, 2003). Because pronghorns avoid the border area, fawns are not born in the area of proposed action.

The Arizona Game and Fish Department monitors the status and movements of Sonoran pronghorn in the national monument and provides weekly updates on locations of radio-collared animals. In 1998 the U.S. pronghorn population was estimated at approximately 142 animals. The December 2000 survey resulted in an estimate of 99 animals. The December 2002 survey showed that the U.S. population had decreased to only 33 animals (NPS 2003c). The current population is estimated at approximately 22–33 pronghorn (NPS 2003f).

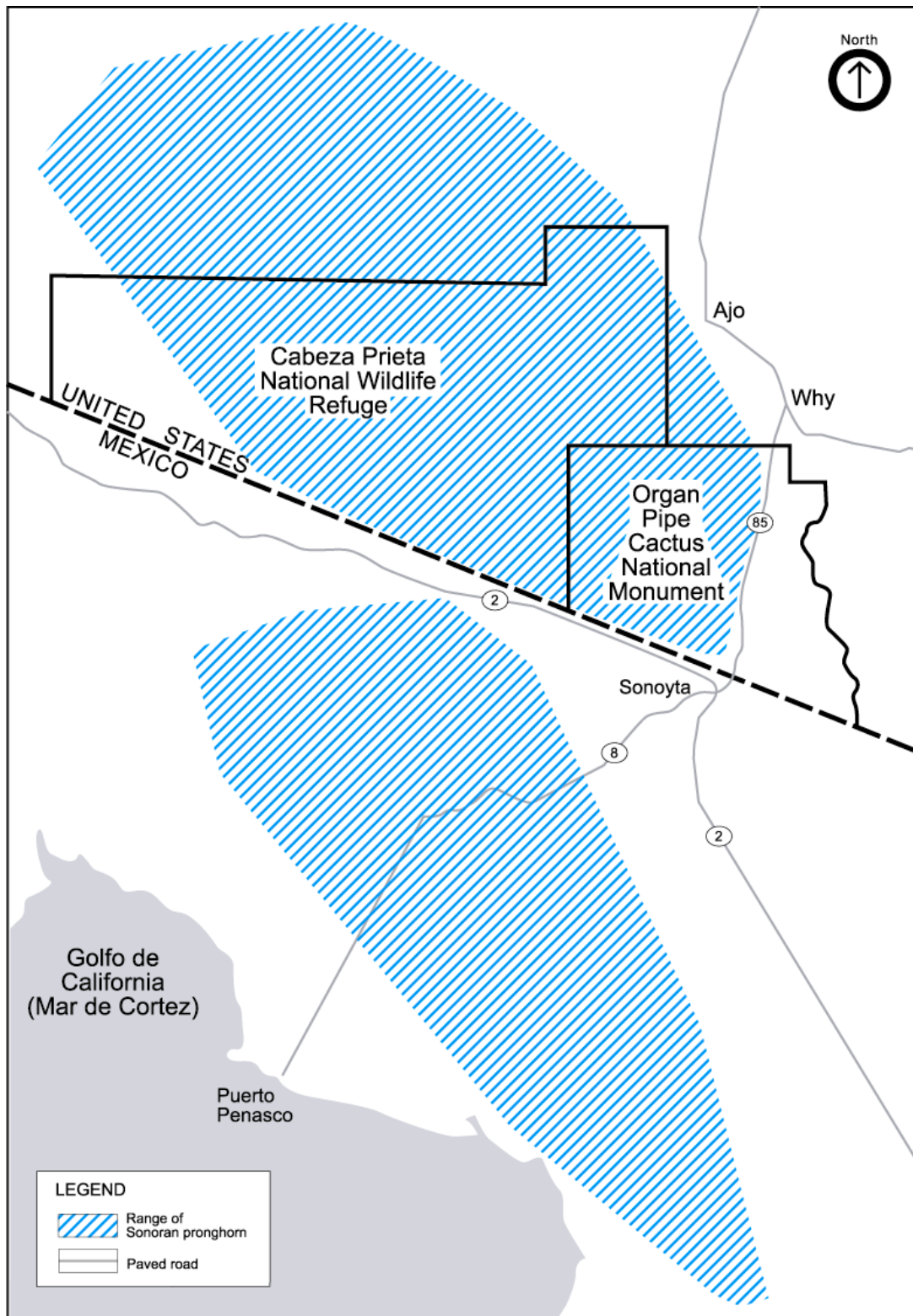
Lesser Long-nosed Bat. Of the three bat species that are listed, only the lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*) is endangered and is also classified as a state wildlife species of special concern. The California leaf-nosed bat (*Macrotus californicus*) and Underwood's mastiff-bat (*Eumops underwoodi*) are both category 2 candidate species.

The lesser long-nosed bat can usually be found in Arizona from April to September and in Mexico the rest of the year. The bat is in jeopardy because of disturbance to roost sites and direct killing by humans. In addition, the bats are threatened by a loss of food sources (paniculate agave). Agaves are harvested by the liquor industry in Mexico, and because agave stalks are rich in carbohydrates, they are particularly palatable as they begin to bolt and are eaten by domestic livestock and wild herbivores, including deer, javelina, rodents, and rabbits (Howell 1996).

The lesser long-nosed bat feeds on agave and columnar cacti throughout most of the monument. In the daytime it roosts in caves and abandoned tunnels, where it is easily disturbed. By night it forages on nectar and pollen from saguaros, organ pipe cactus, and agaves. Surveys conducted between 1992 and 1993 indicate that the greatest densities of lesser long-nosed bats, based on the sizes of roosts, existed in northern Mexico and southern Arizona. The estimated sizes of roosts in Arizona and Mexico during this period ranged from 20 to 150,000 bats (USFWS 1995b).

This nectar-feeding bat is an important pollinator of both organ pipe and saguaro cactus. From April through June bats establish maternity roosts at lower elevations in southwestern Arizona. The largest known maternity colony in the United States (approximately 16,000–24,000 bats) occurs in an abandoned mine adit in the Ajo Mountains, 15 miles north of the border at its nearest point. Smaller

Figure 12: Range of Sonoran Pronghorn



maternity roosts probably exist in the Ajo and Puerto Blanco Mountains (NPS 1995, T. Tibbitts, pers. comm., P. Steinholtz, URS, Jan. 8, 2003; NPS 1995; NPS 2003c). Potential threats to the bat include smugglers who use roost sites for hideouts and loss of food due to habitat destruction caused by off-road driving and construction projects (NPS 2003c). The U.S. Fish and Wildlife Service issued a recovery plan for the lesser-long nosed bat in 1995 (USFWS 1995b).

Both the California leaf-nosed bat and Underwood's mastiff-bat are year-round residents. The California leaf-nosed bat is a common bat at Organ Pipe Cactus, roosting in caves and abandoned mine adits. Because this non-hibernating bat cannot survive low temperatures for extended periods, it roosts deep within mine adits in winter. This largely insectivorous bat probably forages within a few miles of its day roosts; rarely does it occur in open areas far from the mountains.

Little is known about the life history of Underwood's mastiff-bat. This insectivorous bat is known only from Quitobaquito pond. Although no roosts have been located within the monument, based on habitat preferences of the related western mastiff-bat (*Eumops perotis*), this bat probably roosts high on steep cliffs in rock crevices. Like the California leaf-nosed bat, Underwood's mastiff-bat requires surface water (NPS 1995).

Birds

Of the 17 threatened or endangered bird species reported in the monument, only two are resident. The cactus ferruginous pygmy-owl is a federally listed endangered species. The loggerhead shrike is a candidate for federal listing under the Endangered Species Act.

Cactus Ferruginous Pygmy-Owl. The cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*) is an uncommon permanent resident that occurs in washes, canyons, and saguaro stands; it typically nests in riparian areas during June and July. Through limited surveys, the park has located and annually monitors three to seven territories since 1995. An analysis of data through 1998 found that 53% of owl locations were in middle and upper bajada Arizona uplands desertscrub, while 37% were associated with xeroriparian habitats. The remaining 10% were associated with foothills or lower bajada areas. Surveys since then have located additional occupied areas, confirming a habitat preference for middle and upper bajada desertscrub or xeroriparian associations. Approximately 50% (167,000 acres) of the monument may be suitable pygmy-owl habitat of varying quality (NPS 2003c).

The pygmy-owl begins nesting in cavities in trees or cacti such as the organ pipe or saguaro from late winter to early spring (Pima County 2003). Several territories of high-quality habitat are occupied almost every year. Other sites of moderate quality are occupied more erratically. In 2002 the continuing drought may have affected pygmy-owl nesting, because birds located in late winter were generally undetectable by mid-spring. In recent years, two to three known pygmy-owl territories suffered habitat impacts and are suspected to have suffered disturbance due to illegal off-road driving by smugglers and illegal immigrants (NPS 2003c).

The proposed project area and adjacent landscapes contain varying amounts of suitable habitat for pygmy-owls. Only two locations have been surveyed for the presence of owls. One area is approximately 2 miles west of the Sonoyta Mountains and north of the South Puerto Blanco Drive; a 1998 survey detected no pygmy-owls. Also, monument files contain a single record of a pygmy-owl at Quitobaquito in 1964, but none have been detected here in recent years (NPS 2003c).

Approximately the eastern 14.13 miles of the project area were proposed as critical habitat for the pygmy-owl on November 27, 2002. Within that proposed critical habitat, and along the entire 30-

mile length of the project, habitat for pygmy-owls varies from suitable to unsuitable. Habitat along the project area ranges from steep rocky slopes (unsuitable habitat), across upper, middle, and lower bajada settings (habitat of varying suitability), and traverses valley floor areas (generally unsuitable). The project also would pass through areas heavily impacted by past agriculture, current agriculture (in Mexico), urban development, and illicit cross-border traffic. These areas are largely unsuitable as pygmy-owl habitat (NPS 2003c). Monument staff assessed pygmy-owl habitat along the entire project length, not just the proposed critical habitat section. Approximately 24 acres of moderate to high quality pygmy-owl habitat lie in the area of proposed construction.

Loggerhead Shrike. The loggerhead shrike (*Lanius ludovicianus*) is a rare summer and common winter resident, found particularly in desert scrub habitat (NPS 1995). Loggerhead shrikes, commonly known as butcher birds for their habit of impaling their prey on thorns, are a federally listed species of concern. Shrikes are songbirds with hawk-like behavior and hook-tipped bills. They feed on insects, lizards, mice, or small birds (Peterson 1961).

Loggerhead shrikes are found from southern Canada to southern Mexico in open country. Common habitat features include lookout posts, wires, scattered trees, low scrub, or deserts. Shrikes nest in bushes or trees and breed from southern British Columbia south through the western United States. They winter mainly in the southwestern states (Southwest Parks and Monuments Association 1993). Populations of loggerhead shrikes have declined drastically due to the following causes:

- use of pesticides, which has reduced the supply of insects, the shrikes' main food; pesticides also may have adversely affected the birds' reproductive physiology (NPS 2002d)
- loss of habitat, including wintering habitat, due to land development in coastal regions (NPS 2002d)

Other Species. Of the five species of hawks and falcons on the monument's list of threatened or endangered species, four are rare transients — American peregrine falcon (*Falco peregrinus anatum*), osprey (*Pandion haliaetus*), common black-hawk (*Buteogallus anthracinus*), and crested caracara (*Polyborus plancus*) — and the ferruginous hawk (*Buteo regalis*) is a casual visitor.

Most reports of transient and casual visitors are from Quitobaquito, perennial springs, the headquarters area, and park roads. The peregrine falcon has been observed most often in the Ajo Mountains, where it presumably nested in the past; it is also a rare winter visitor. Ospreys have been sighted at Quitobaquito, Burro Spring and William's Spring (which are just north of Quitobaquito), and along Arizona 85; and the common black-hawk has been sighted at Quitobaquito, Aguajita Spring, and Puerto Blanco Drive. The crested caracara, a sporadic year-round visitor, has been observed most frequently near the visitor center campground, Aguajita Spring, Quitobaquito, and Ajo Mountain Drive. The ferruginous hawk has been recorded on only four occasions, the last time in February 1982. Nearly all sightings have been along Arizona 85 (Groschupf et al. 1988).

Transient visitors include the great egret (*Casmerodius albus*), snowy egret (*Egretta thula*), willow flycatcher (*Empidonax traillii*), and white-faced ibis (*Plegadis chihi*). The great egret and willow flycatcher are rare spring and irregular fall transients. Individuals and small flocks of great egrets have been reported at open water or flying over the monument. The willow flycatcher was last sighted in August 1981 at Quitobaquito. The snowy egret and white-faced ibis, both uncommon transients, have been observed most often at open water; small flocks of the snowy egret have been reported at Quitobaquito and the monument's sewage lagoon, whereas nearly all sightings of the white-faced ibis have been at Quitobaquito (Groschupf et al. 1988).

Amphibians and Reptiles

Five species are candidates (category 2) for federal protection under the Endangered Species Act — the Sonoyta mud turtle (*Kinosternon sonoriense longifemorale*), the Sonoran desert tortoise (*Gopherus agassizii*), the chuckwalla (*Sauromalus obesus*), the canyon spotted whiptail (*Cnemidophorus burh*), and the Mexican rosy boa (*Lichanura m. mexicana*).

Sonoran mud Turtle. Of the two turtles in the monument, the Sonoran mud turtle population at Quitobaquito may face extirpation due to low hatchling and juvenile survivorship and poor recruitment of adult females. Quitobaquito contains the monument's only known population of this aquatic reptile, which is an uncommon resident of desert lowlands.

Sonoran Desert Tortoise. The desert tortoise is of particular concern because it faces threats throughout its range. Two tortoise populations exist — the Mohave (California), which is listed as threatened, and Sonoran (Arizona/Utah) populations, which is a candidate species and is found in Organ Pipe Cactus. Sonoran tortoises occur on rocky slopes, upper bajadas, and to a lesser extent, near valley floors. High and medium quality Sonoran tortoise habitat exists near the international boundary (T. Tibbitts, pers. comm., P. Steinholtz, URS, Jan. 15, 2003).

Chuckwalla. Chuckwallas are relatively abundant in the monument. They live primarily in rock pile habitats, such as the Sonoyta Mountains and Sierra de Santa Rosa. They do not exist near the international border. Chuckwallas have not experienced a human-induced population decline of major consequence.

Canyon Spotted Whiptail. The largest known population of the canyon spotted whiptail is in the Ajo Mountains, in the northeastern area of the monument. The whiptail has not experienced a human-induced population declines of major consequence.

Mexican Rosy Boa. Of the four reptiles being considered for federal listing, only the rosy boa appears to be substantially affected by highway mortality along Arizona 85. This snake is on the periphery of its range at the monument and is rare in this area (Lowe and Rosen 1992).

Fish

The Quitobaquito desert pupfish (*Cyprinidon macularius eremus*), endemic to the spring outflows and pond at Quitobaquito, is federally listed as endangered. In September 1993 the U.S. Fish and Wildlife Service prepared a recovery plan outlining measures to protect the existing population as well as increase the prospects for subspecies' survival. This rare pupfish has been afforded additional habitat protection through the designation of Quitobaquito as critical habitat.

Anthropogenic impacts (e.g., water pollution, groundwater depletion, introduction of nonnative fish) and stochastic events (e.g., environmental perturbations, decline in habitat quality) pose a potential threat to the subspecies' survival. Since 1975, a monitoring program has been conducted annually to assess the population's status (NPS 1995). The current population is above the low levels recorded in 1992 and 1994 (and some years in the 1980s), but not as high as in 1995 to 1996. No causative factors were identified for the decline after 1996. The population reduction since the mid 1990s is a cause of moderate concern. Quitobaquito contained at least 3,500 pupfish in September 2002 (NPS 2003c). The pupfish breed during the warmer months of the year (April–September) (T. Tibbitts, pers. comm., P. Steinholtz, URS, Jan. 8, 2003). See the mitigation planned for alternative B for more information on how species at Quitobaquito would be protected (see page 31).

Invertebrates

The Quitobaquito snail (*Tryonia quitobauitae*) is the only monument invertebrate being considered for listing under the Endangered Species Act. This snail, endemic to the pond and spring outflows at Quitobaquito, is a category 2 candidate species. Detailed knowledge of the basic biology of the species is required to support its listing as either endangered or threatened.

Wildlife Species of Special Concern

In addition to those wildlife species afforded enhanced protection under the Endangered Species Act, other monument species are of special concern because they are (1) locally rare, (2) of interest to poachers, or (3) their population status within the monument is unknown. Locally rare species include those experiencing specific negative impacts (e.g., highway mortality for the Organ Pipe shovel-nosed snake), long-term declines (e.g., spotted leaf-nosed snake) or low, unstable population sizes (e.g., Sonoran mud turtle), and species at the edge of their range or restricted in distribution.

The high value of many species on the black market makes the monument a prime target for poachers. Among its wildlife species, reptiles face perhaps the greatest threat. Reptiles of particular interest to poachers include all snake species as well as the Gila monster and desert tortoise.

ENVIRONMENTAL CONSEQUENCES

Methodology and Intensity Thresholds

All available information on known threatened or endangered species was compiled. Predictions about short- and long-term site impacts were based on existing data from Organ Pipe Cactus National Monument. The thresholds of change for the intensity of an impact are defined as follows:

- Negligible:* An action 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 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 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 would have a noticeable change to a population or a large number of individuals of a species or resource. The change would be measurable and would 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 establishing 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 NPS planning documents.

Impacts of Alternative A: The No-Action Alternative

Mammals

Sonoran Pronghorn. Under the no-action alternative the existing barrier along the international border would continue to restrict Sonoran pronghorn movement. Currently, pronghorn do not

appear to cross the international boundary due to the combined effects of (1) the livestock fence along the border, (2) Mexico Highway 2, (3) intermittent right-of-way and livestock fencing along Highway 2 between Sonoyta and San Luis, and (4) human settlements and activity.

Continued, adverse, long-term, moderate impacts would result from illegal vehicular activity in the monument's backcountry, which would degrade pronghorn habitat. Disturbance and restriction or modification of pronghorn movements due to cross-country vehicular noise and dust would continue, creating adverse, long-term, moderate impacts to the pronghorn.

Lesser Long-nosed Bat. This alternative would not directly impact any potential roosting habitat. Foraging habitat would not be lost due to construction activities.

Adverse, long-term, moderate impacts would result from continuing illegal vehicular activity in the monument's backcountry, which would negatively impact food plants for the lesser long-nosed bat.

California Leaf-nosed Bat and Underwood's Mastiff-Bat. No impacts are anticipated under this alternative.

Birds

Loggerhead Shrike. Adverse, long-term, moderate impacts would result from continued illegal vehicular activity in the monument's backcountry, which would impact the loggerhead shrike's habitat.

Cactus Ferruginous Pygmy-Owl. Adverse impacts on pygmy-owl habitat from cross-country driving by smugglers and illegal immigrants would continue. In addition, rehabilitation would not begin on the extensive areas already impacted by illicit off-road driving. Overall, adverse, minor to moderate long-term impacts to habitat for the owl would result from continued illegal vehicular activity in the monument's backcountry.

Amphibians and Reptiles

Sonoran Mud Turtle. The aquatic environment at Quitobaquito would not likely be impacted by this alternative; therefore, no impacts to this turtle are anticipated.

Sonoran Desert Tortoise. Adverse, long-term, moderate impacts would result from continued illegal vehicular activity in the monument's backcountry, which would impact tortoises and their habitat.

Chuckwalla. This species does not exist near the international border; therefore, no impacts are anticipated.

Canyon Spotted Whiptail. This species does not exist near the international border; therefore, no impacts are anticipated.

Mexican Rosy Boa. Adverse, long-term, moderate impacts would result from continued illegal vehicular activity in the monument's backcountry, which would impact habitat and promote poaching.

Fish

Quitobaquito Desert Pupfish. Under the no-action alternative, no direct impacts to the pupfish or their habitat are anticipated. Under existing conditions a vehicle could potentially drive from Mexico Highway 2 to the edge of Quitobaquito pond and unload contaminants or nonnative fish. Although this has not yet happened, a 10-inch black bullhead (*Ictalurus melas*) was caught and removed from the southwest spring during a census for the Sonoran mud turtle in 1993. It is unknown whether this fish represented an isolated incidence or was part of a larger population released into the Quitobaquito system (NPS 1995).

Under existing conditions wildfire could spread from informal campsites and smuggler staging areas within the mesquite bosque on the Mexican side of the border to the woodlands surrounding Quitobaquito. Such fire could have detrimental effects by possibly killing significant number of pupfish from heat in the shallow areas. Ash input into the waters could further harm surviving fish (NPS 2003c).

Invertebrates

Quitobaquito Snail. The pond and spring flows would not be impacted by this alternative; therefore, no impacts are anticipated to this snail.

Cumulative Impacts

Future USBP activities (see page 51) could result in adverse, short-term, negligible impacts due to construction activities. However, beneficial, long-term, negligible impacts would occur due to increased protection of natural resources. Under the no-action alternative impacts would be adverse, long term, minor to moderate. When combined with reasonably foreseeable future actions, the cumulative impacts would be adverse, long term, and minor to moderate.

Conclusion

Sonoran pronghorn habitat would continue to be affected by illegal vehicular activity in the monument's backcountry, resulting in adverse, long-term, moderate impacts. Disturbance and restriction or modification of pronghorn movements due to cross-country vehicular noise and dust would continue, creating adverse, long-term, moderate impacts to pronghorn. Impacts on the lesser long-nosed bat would be adverse, long term, and moderate as a result of continued illegal vehicular activity in the monument negatively impacting food plants. Impacts on habitat for the cactus ferruginous pygmy-owl habitat as a result of continued illegal vehicular activity would be adverse, long term, and minor to moderate. The no-action alternative would have no effect on the Quitobaquito desert pupfish. Overall, most species would experience adverse, short- and long-term, minor to moderate impacts. Cumulative impacts would be adverse, long term, minor to moderate.

Because there would be no major, adverse impacts to threatened, endangered, or sensitive species, there would be no impairment of park resources or values.

Impacts of Alternative B: The Preferred Alternative

Mammals

Sonoran Pronghorn. The proposed project would disturb approximately 70 acres of habitat, almost half of which exists east of Arizona 85, where it is highly unlikely that Sonoran pronghorn would occur (either in the United States or Mexico). All acreage that would be affected is immediately

adjacent to the international boundary and Mexico Highway 2. This acreage is very small in the regional context of the approximately 2 million acres of potentially suitable habitat available to the U.S. pronghorn population.

Approximately half of the project length is immediately adjacent to Mexico Highway 2, a busy highway that pronghorn are unlikely to approach. West of Arizona 85 project construction would take place an average of approximately 328 feet north of Mexico Highway 2. Radiotelemetry data gathered by the Arizona Game and Fish Department, as well as biennial Sonoran pronghorn surveys, indicate the area along the border is seldom used by Sonoran pronghorn (NPS 2003c). Therefore, construction would create the potential for adverse, short-term, negligible to minor impacts.

As stated under alternative A, pronghorn do not appear to cross the international boundary due to the combined barrier effects of (1) the livestock fence along the border, (2) Mexico Highway 2, (3) intermittent right-of-way and livestock fencing along Highway 2 between Sonoyta and San Luis, and (4) human settlements and concentrations of activity. The proposed vehicle barrier would replace the livestock fence in some areas, while in other areas a livestock fence would remain several feet south of the vehicle barrier. Any long-term, beneficial effects of a wildlife-friendly barrier on pronghorn movement would be negated by the evidence that development and activities along the border are already a barrier to pronghorn movement.

Illicit cross-country driving and law enforcement efforts to control such activity has resulted in adverse, long-term, major, impacts from destruction of habitat and the restriction or modification of pronghorn movements (NPS 2001a). The great majority of illegal roads in the monument exist west of Arizona 85 in Sonoran pronghorn habitat. The proposed vehicle barrier would eliminate or greatly reduce use of these roads, resulting in the eventual restoration of approximately 132 miles of illegal roads (NPS 2003c).

In addition, the peak period for illegal travel through the monument is February through May, which coincides with pronghorn fawning season. The proposed vehicle barrier would reduce or eliminate illegal vehicular traffic at this sensitive time of the year (NPS 2003c).

Overall, beneficial, long-term, moderate impacts would result from eliminating illegal vehicular activity in the monument's backcountry, which would help protect pronghorn habitat. Disturbance and restriction or modification of pronghorn movements due to cross-country vehicular noise and dust would also be reduced or eliminated, creating beneficial, long-term, moderate impacts to the pronghorn.

A detailed analysis of the expected effects of this project on threatened or endangered species is the subject of a separate biological assessment (NPS 2003c), which states that the implementation of this project may affect, but is not likely to adversely affect, the Sonoran pronghorn or its habitat due to construction activities. However, eliminating or reducing illegal vehicular activity in the monument would likely have a beneficial effect.

Lesser Long-nosed Bat. No known or suspected roost sites of this endangered bat would be directly or indirectly impacted by the proposed action. At its closest point, the proposed action area would be approximately 15 miles from the known maternity colony, so there would be no direct or indirect effects on that colony site. The proposed action would not directly impact any potential roosting habitat.

The proposed project would disturb approximately 70 acres of existing habitat for food plants used by the lesser long-nosed bat, including saguaro and organ pipe cactus. Of the monument's

approximately 330,000 acres, almost half (165,000 acres) may provide a relatively high density of food plants for the lesser long-nosed bat. Disturbance of 70 acres in the project area would affect approximately 0.04% of the available foraging habitat in the monument (NPS 2003c). Staging and turnaround areas would be designed and located to avoid these cacti to the greatest extent possible. It is unknown at this time how much additional loss of foraging habitat is now taking place due to extensive damage by smugglers and illegal immigrants, invasion by nonnative plants, disease, or other factors.

Construction could lead to an increase in invasive species in the project area, which could adversely affect the bat through changes in plant species richness, species and community diversity, structure, and fire frequency. However, mitigation measures would be taken to control nonnative species.

Illegal vehicle use in the backcountry damages the shallow root systems of large plants, causing loss of vigor or death. Off-road driving routinely results in the destruction of numerous small saguaro and organ pipe cactus, and large numbers of seedlings. Preventing or reducing the amount of off-road driving would result in the restoration of approximately 95 acres of habitat for the lesser long-nosed bat (NPS 2003c). This would be a beneficial, long-term, moderate impact in terms of protecting food plants for the lesser long-nosed bat.

A detailed analysis of the expected effects of this project on threatened or endangered species is the subject of a separate biological assessment (NPS 2003c), which states that implementation of this project may adversely affect the lesser long-nosed bat or its habitat due to construction activities. However, eliminating or reducing illegal vehicular activity in the monument is likely to beneficially affect this species.

California Leaf-nosed Bat and Underwood's Mastiff-bat. No roosting habitat for either of these insectivorous species exists within the area of disturbance for the proposed project. The California leaf-nosed bat rarely occurs in open areas far from the mountains. Underwood's mastiff-bat is known only from Quitobaquito pond, which is outside the affected area. Both these bats require surface water, which would not be directly impacted by the proposed action. Therefore, no impacts are anticipated.

Birds

Loggerhead Shrike. The loggerhead shrike is a common winter resident and rare summer resident in the monument. Suitable foraging and nesting habitat exists in the area of proposed construction; however, because construction is proposed to begin between September and October 2003, impacts to the shrike would be minor.

Because illegal vehicular and pedestrian activity has degraded much of the habitat along the border, the impacts to this bird resulting from construction activities would be adverse, short term, and negligible to minor. Beneficial, long-term, moderate impacts would result from reducing or eliminating illegal vehicular activity in the backcountry, which would help protect the loggerhead shrike's habitat.

Cactus Ferruginous Pygmy-Owl. The proposed project would have adverse, long-term, minor impacts on the cactus ferruginous pygmy-owl by affecting up to 32.6 acres of moderate to high quality habitat, not all of which is proposed as critical habitat. The project would impact 36.5 acres of unsuitable habitat (low or poor quality), some of which is in the area proposed as critical habitat (NPS 2003c).

Construction could lead to an increase in invasive species in the project area, which could adversely affect the owl through changes in plant species richness, species and community diversity, structure, fire frequency, and animal community structure (NPS 2003c). However, mitigation measures would be taken to control nonnative species.

The proposed project would result in adverse, long-term, minor impacts to proposed critical habitat for the pygmy-owl, and would also result in adverse, long-term, minor impacts to suitable pygmy-owl habitat that has not been proposed as critical habitat.

Approximately 75% of the illegal roads in the monument exist within proposed pygmy-owl habitat. Preventing or reducing illegal backcountry driving would allow restoration to begin on 111 miles of illegal roads, equating to approximately 107.6 acres of proposed pygmy-owl critical habitat (NPS 2003c). Some of the illegal roads pass through suitable pygmy-owl habitat, and even through known owl territories. The proposed vehicle barrier would result in restoration of approximately 47 miles of illegal roads (45.6 acres) in suitable habitat. The barrier would also prevent or diminish future habitat degradation caused by illegal vehicular use.

In addition, the peak period of illegal vehicular use in the monument occurs between February and May, which coincides with pygmy-owl breeding season. The proposed vehicle barrier would reduce or eliminate illegal vehicular traffic at this sensitive time of year (NPS 2003c).

Overall, beneficial, long-term, minor to moderate impacts would result from the reduction of illegal vehicular activity in the monument's backcountry, which would increase protection of habitat for the owl.

A detailed analysis of the expected effects of this project on threatened or endangered species is the subject of a separate biological assessment (NPS 2003c), which states that implementation of this project may adversely affect the cactus ferruginous pygmy-owl due to construction activities. Construction activities may also adversely modify proposed critical habitat. However, this project may beneficially affect this species due to eliminating or reducing illegal vehicular activity in the monument.

Amphibians and Reptiles

Sonoran Mud Turtle. Quitobaquito contains the monument's only known population of this species, which is an uncommon resident of desert lowlands. Quitobaquito would not be impacted by the project. Therefore, no impacts to this turtle are anticipated.

Sonoran Desert Tortoises. Sonoran desert tortoises are more likely to be found on rocky slopes and upper bajadas than near valley floors. The project would cross Sonoran desert tortoise habitat of high and medium quality (T. Tibbitts, pers. comm., P. Steinholtz, URS, Jan. 15, 2003). If any tortoises were found during construction, they would be handled in accordance with "Arizona Game and Fish Department Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects" (AGFD 1997). Potential adverse, short-term, negligible to minor impacts to Sonoran desert tortoises could occur due to construction.

Because illegal vehicular and pedestrian activity has degraded much of the existing habitat along the border, the impacts to tortoise habitat as a result of construction activities would be adverse, short term, and negligible to minor. Beneficial, long-term, moderate impacts would result from reducing or eliminating illegal vehicular activity in the backcountry, which would help protect tortoises and their habitat.

Chuckwalla. While chuckwalla are relatively abundant in the monument, they do not exist near the international border; therefore, no impacts are anticipated.

Canyon Spotted Whiptail. While the canyon spotted whiptail is found in the Ajo Mountains, it does not occur near the international border; therefore, no impacts are anticipated.

Mexican Rosy Boa. Suitable habitat for the Mexican rosy boa could exist in the area of proposed construction. Because illegal vehicular and pedestrian activity has degraded much of the existing habitat along the border, impacts resulting from construction activities would be adverse, short term, and negligible to minor. The Mexican rosy boa has increased in popularity in the pet trade, and thus may be prone to poaching. Beneficial, long-term, moderate impacts would result from reducing illegal vehicular activity in the monument's backcountry, which would help protect its habitat and prevent poaching.

Fish

Quitobaquito Desert Pupfish. Adverse impacts of the proposed project on the desert pupfish are not expected because of mitigating measures included in the alternative (see page 30). A vehicle barrier would reduce the possibility of a vehicle potentially driving from Mexico Highway 2 to the edge of Quitobaquito pond and unloading contaminants or nonnative fish.

The project would result in beneficial impacts because a gap would be created in the mesquite canopy approximately 30 feet wide along the international boundary south of the pond. This gap could serve as a firebreak, thus stopping the spread of any wildfire from informal campsites and smuggler staging areas within the mesquite bosque on the Mexican side of the border to the woodlands surrounding Quitobaquito (NPS 2003c). Impacts are expected to be beneficial, long term, and minor.

A detailed analysis of the expected effects of this project on threatened or endangered species is the subject of a separate biological assessment (NPS 2003c), which states that this project may affect, but is not likely to adversely affect, the Quitobaquito desert pupfish due to construction activities. No adverse modification of designated critical habitat would occur. Implementation of this project may affect, and is likely to beneficially affect, this species due to eliminating or reducing illegal vehicular activity in the monument.

Invertebrates

Quitobaquito Snail. The Quitobaquito snail is endemic to the pond and spring outflows at Quitobaquito. The pond and spring flows would not be impacted by the project; therefore, no impacts are anticipated.

Cumulative Impacts

Future USPB plans in the area (see page 51) could result in adverse, short-term, negligible impacts due to construction. However, impacts due to increased protection of resources would result in beneficial, long-term, negligible impacts. Under alternative B overall impacts on threatened, endangered, or sensitive species would be beneficial, long term, minor to moderate. When combined with reasonably foreseeable future actions, cumulative impacts would be beneficial, long term, and moderate.

Conclusion

Construction could create the potential for adverse, short-term, negligible to minor impacts to the Sonoran pronghorn. However, reducing disturbance and habitat degradation would result in beneficial, long-term, moderate benefits to the pronghorn. These beneficial effects would greatly outweigh the potential adverse effects to the pronghorn.

The lesser long-nosed bat could be adversely affected through the removal of food plants. However, reducing illegal off-road driving and subsequent impacts on food plants in the backcountry would result in beneficial, long-term, moderate impacts. The beneficial effects are likely to outweigh the adverse effects.

Impacts to proposed critical habitat and suitable habitat for the pygmy-owl would be adverse, long term, and minor. Reducing illegal vehicular activity in the backcountry would result in beneficial, long-term, minor to moderate impacts because of increased protection of owl habitat.

Mitigation measures would avoid all potential adverse impacts from construction on the Quitobaquito desert pupfish. No adverse modification of designated critical habitat for the Quitobaquito desert pupfish would occur. Over the long term this alternative would offer greater protection by preventing or reduced illegal vehicle use, resulting in beneficial, long-term, minor impacts.

Overall, most species would experience adverse, short-term, negligible to minor impacts from construction activities, as well as beneficial, long-term, minor to moderate impacts.

Cumulative impacts would be beneficial, long term, and moderate.

Because there would be no major, adverse impacts to threatened, endangered, or sensitive species, there would be no impairment of park resources or values.

VISITOR USE, UNDERSTANDING, AND APPRECIATION

AFFECTED ENVIRONMENT

Access to Organ Pipe Cactus National Monument is by way of Arizona 85, which transverses the monument from north to south (see Figure 2).

VISITOR PROFILE

Monthly visitor use figures consistently show that the heaviest use occurs in the spring, declines in summer, and then increases again in the fall and winter. Based on a visitor use survey conducted from January 29 through February 4, 1989 (with 561 out of 650 surveys returned), visitors arrive more frequently during the week than on weekends. Over 80% of survey respondents were over 50 years of age, with 54% aged 50–59. These age data are comparable to a 1970 study, which revealed that over 70% of visitors were over age 50. About 18% of visitors came from California, followed by Arizona with 12%. Approximately 75% of the survey respondents stayed at the monument for 1 or more nights (NPS 1995).

The predominant mode of transportation was passenger cars (38%); however, some visitors had more than one type of vehicle with them. Nearly 53% of visitors used either a recreational vehicle (RV) or trailer. No tour buses were recorded in the survey (NPS 1995).

The dominant use of the monument appears to be by RV campers who take moderate walks on designated trails and participate in the evening interpretive programs. Almost 60% of the visitors used Lukeville for commercial services.

Almost 330,000 people visited the monument for recreation purposes in 2001.

VISITOR EXPERIENCE

In the 1989 survey, 91% of the respondents indicated that park scenery was “extremely” or “very” important to them, and vistas from within the monument may extend for more than 70 miles. Other important qualities were solitude, rated by 72% as extremely or very important, and opportunities to enjoy a clear night sky, which was important to 58%. These responses indicate the value of a quiet, natural park undisturbed by developments and the distractions of noise, traffic, and lights (NPS 1995).

The primary park experience involves driving one or both of the scenic unpaved one-way loop drives: the 21-mile Ajo Mountain Drive through the Diablo Mountains and along the foothills of the Ajo Mountains, and the 53-mile Puerto Blanco Drive that circles the Puerto Blanco Mountains. Puerto Blanco Drive provides access to Quitobaquito Springs and continues east along the border. This is the only area where a vehicle barrier or fence would be visible from this road.

The monument includes approximately 25 miles of trails. The closest trail to the border accesses the historic Victoria Mine site, approximately 3 miles from the boundary. Eight primitive, unmaintained, backcountry destination trails originate from Ajo Mountain Drive, Puerto Blanco Drive, or Alamo Canyon. Over half of the park visitors hike trails, and only about 8% hike cross-country. Many visitors surveyed asked for more trails; 21% of them asked for a greater range of trail lengths, and 14% felt that all park trails should remain primitive.

FACILITIES

Camping Areas. Three types of camping areas are provided in the park: RV campgrounds, drive-in/primitive campgrounds, and backcountry camping. The Twin Peaks campground is just south of the visitor center, approximately 5 miles from the border. A group campground is nearby with five group sites. The drive-in/primitive campground at Alamo Canyon Wash contains four walk-in tent sites with adjacent parking and one vault toilet facility (NPS 1995). Permits are required for backcountry camping (NPS 1995).

Quitobaquito Springs. Visitor development at Quitobaquito Springs consists of a parking area, informal trails, and picnic tables. Visitors do not receive orientation to the site, nor do they receive information about how to use the area without adversely impacting the sensitive resources. The parking area and approach to the spring have an improvised appearance, and vandalism of picnic tables and are signs is apparent (NPS 1995).

Lukeville. Lukeville is an unincorporated, developed border community within park boundaries at the terminus of Arizona 85, 5 miles south of the park's visitor center. There is an 8.2-acre U.S. Customs and Immigration Reserve, surrounded by 65.3 acres of private lands (NPS 1995).

The Customs and Immigration reserve is used for border operations and 13 residences. On surrounding land private developments consist of a 10-unit motel, a 95-site RV campground, 8 mobile home sites, and an apartment building. Commercial services include a café, bar, general store, convenience store, laundry, post office, two gas stations, an automotive repair station, and storage facilities. Property formally known as the Kalil Tract contains additional commercial services. There is also a landfill and an airstrip along the eastern boundary of the town (NPS 1995).

The border crossing at Lukeville is the only access to Mexico between Sasabe, approximately 85 miles to the east, and San Luis, approximately 130 miles to the west. Thus it is an important access point for Americans traveling to the upper portion of the Gulf of Mexico, and for Mexicans entering the United States from northwestern Sonora. The port-of-entry is currently open daily between 6:00 A.M. and midnight, and vehicles back up in the monument waiting for the entry to open, especially during spring break for American universities and American holidays, such as Labor Day (NPS 1995).

ENVIRONMENTAL CONSEQUENCES

METHODOLOGY AND INTENSITY THRESHOLDS

Past visitor use data, comment letters from the public, and personal observations of visitation patterns 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 impact thresholds are defined as follows:

- Negligible:* The impact would be barely detectable and/or would affect few visitors.
- Minor:* The impact would be slight but detectable, and/or would affect some visitors.
- Moderate:* The impact would be readily apparent and/or would affect many visitors.
- Major:* The impact would be severely adverse or exceptionally beneficial and/or would affect the majority of visitors.

IMPACTS OF ALTERNATIVE A: THE NO-ACTION ALTERNATIVE

Under alternative A vehicles would continue to enter the monument illegally from Mexico. Values rated important by monument visitors, such as solitude and a quiet, natural park undisturbed by developments and the distractions of noise, traffic, and lights, would continue to be compromised by the existence of illegal vehicle use. Vehicular noise, particularly during high-speed chases, would degrade the monument's solitude and natural quiet, resulting in adverse, short- and long-term, moderate impacts.

Visitors, particularly backcountry users, would continue to be exposed to deteriorated natural resources caused by illegal vehicle use. Such damage degrades the park's pristine natural setting. Vandalism at Quitobaquito might also continue or increase with continued illegal vehicular entry. Therefore, the no-action alternative would result in an adverse, short- and long-term, moderate impact to visitors who expect a pristine natural environment.

The presence of abandoned vehicles in the monument (approximately 150 in 2001) would impede or degrade the monument's viewsapes, adversely affecting visitors who believe scenic views are a prime resource. Although the present fence along the border does not impede views, it is an unattractive component of the landscape, particularly near Lukeville, where the fence catches trash and shows signs of breaching, cutting, and trampling. The no-action alternative would result in a continued adverse impact on viewsapes.

Cumulative Impacts

None of the future USBP plans in the area would prevent vehicles from illegally entering the monument, although measures would be taken to deter such entries (see page 51). Viewsapes would be continue to be affected by the presence of abandoned vehicles, and fewer opportunities would be provided to experience a pristine natural environment, including natural quiet. The presence of the LORIScopes could also result in adverse, long-term, negligible impacts to viewsapes. To the extent that planned actions deterred illegal entry, impacts would be beneficial, long term, and negligible.

Under the no-action alternative impacts would be adverse, long term, and minor. When combined reasonably foreseeable future actions, cumulative impacts would be adverse, long term, and minor because no direct measures would be taken to protect visitor experiences.

Conclusion

Under the no-action alternative continued noise and damage to natural resources caused by illegal vehicles in the monument would result in adverse, long-term, minor impacts to visitor experiences. Adverse, long-term, negligible impacts to the monument's viewsapes would continue. Cumulative impacts to visitor experiences would be adverse, long term, and minor.

IMPACTS OF ALTERNATIVE B: THE PREFERRED ALTERNATIVE

During construction some visitors would be exposed to noise generated by heavy equipment and drilling during construction activities. These impacts would be adverse, short term, and minor. Over the long term reducing the amount of illegal vehicular traffic entering the monument's backcountry would reduce noise and traffic, enhancing the monument's solitude and natural quiet and resulting in beneficial, long-term, minor to moderate impacts.

Visitors, particularly backcountry users, would not be exposed to as much natural resource damage caused by off-road illegal vehicle use. Enhancement of the park's pristine natural setting would be a

benefit to park visitors. Vandalism at Quitobaquito might also decrease because illegal vehicular entry would be more difficult. Impacts for visitors who expect a pristine natural environment would be beneficial, long term, and minor to moderate.

The presence of the vehicle barrier would not be seen from the park's trails, campground, or from Ajo Mountain Drive, so it would not impede or degrade monument viewscales. The barrier would be seen from the southern section of Puerto Blanco Drive, where the road parallels the boundary. However, the barrier would only be 6 feet tall, so it would not be an overwhelming visual distraction; allowing the barrier to rust naturally would help it blend into the landscape. The single horizontal rail, rather than a larger, opaque mass like landing mat material would also help keep views unobstructed.

Impacts to viewscales would be adverse, long term, and negligible because the barrier would not be visible from most of the monument. In areas where it would be visible, particularly along Puerto Blanco Drive, it would be allowed to rust naturally and could be a visual aesthetic improvement over the existing cut and torn barbed wire fence (see Figure 13).

Some visitors would be exposed to short-term, minor adverse impacts during barrier construction. Heavy equipment would likely be seen from certain areas of the monument, and dust would be generated by construction.

Figure 13: Existing Breached Border Fence



Cumulative Effects

Future USBP plans in the area (see page 51) could result in adverse, short-term, negligible impacts due to construction. The presence of the LORIScopes could also result in adverse, long-term, negligible impacts to viewscales, particularly when combined with the presence of a vehicle barrier. However, impacts due to increased protection of resources would result in beneficial, long-term, negligible impacts.

Under the preferred alternative impacts on visitor experiences would be beneficial, long term, and minor to moderate. When combined with reasonably foreseeable future actions, cumulative impacts would be beneficial, long term, and minor to moderate.

Conclusion

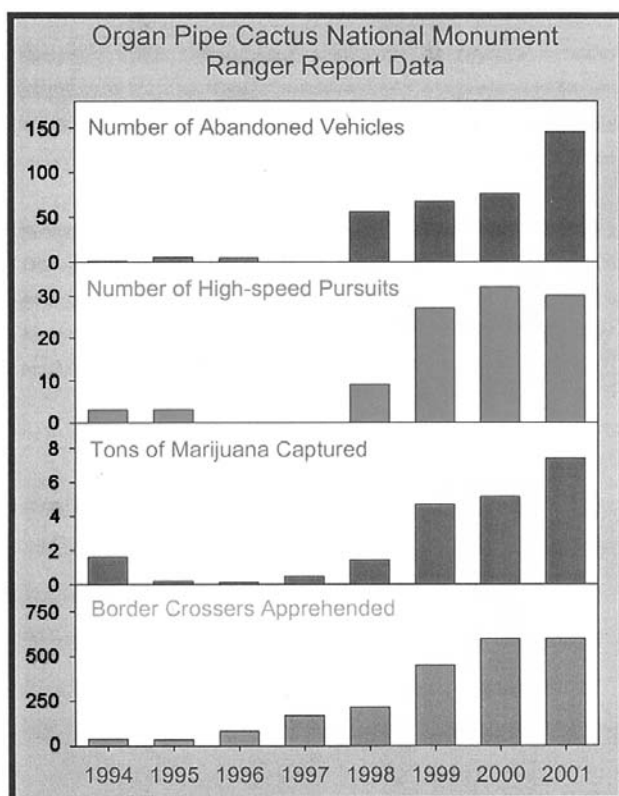
The presence of a vehicle barrier would result in a beneficial, long-term, minor to moderate impact to visitors who expect solitude and a pristine natural environment. Some visitors would be exposed to adverse, short-term, minor impacts during barrier construction due to noise. Long-term impacts to viewscales would be adverse and negligible because the barrier would not be visible from most of the monument. Some visitors would be exposed to adverse, short-term, minor impacts to viewscales during barrier construction. Cumulative impacts to visitor experience would be beneficial, long term, and minor to moderate.

HUMAN HEALTH AND SAFETY

AFFECTED ENVIRONMENT

Law enforcement personnel routinely pursue illegal vehicles at Organ Pipe Cactus National Monument, the single most dangerous activity along the border (NPS 2003b). Kris Eggle, a 27-year-old NPS law enforcement ranger at the monument, was shot and killed in the line of duty on August 9, 2002, while pursuing drug smugglers fleeing from Mexican authorities just north of the border. The individuals entered the United States by vehicle, where it was abandoned (NPS 2002c). The amount of illegal activity has increased at the monument substantially since 1998, as shown in Figure 14. Continued drug and people smuggling (and the high-speed chases that accompany such activities at Organ Pipe Cactus) produces the ongoing potential for injury or death to employees and the public (NPS 2002c).

Figure 14: Organ Pipe Cactus Ranger Report Data



At Quitobaquito Springs car vandalism and theft of visitors' property is a frequent occurrence when people leave their vehicles unattended. A sign was erected to warn visitors of this problem and to suggest that one member of the party stay with the vehicle to protect valuable possessions (NPS 1995).

Illegal vehicular activity is not limited to drivers entering the United States from the south. Smugglers also attempt to reach Mexico from the United States while transporting firearms, engine parts, and other goods. These smugglers drive through the monument's backcountry in order to avoid the port

of entry, presenting the same problems as those who enter from the south (R. Stinson, NPS, pers. comm., P. Steinholtz, URS, Jan. 23, 2003). Table 8 shows the major incident reports that have been recorded at Organ Pipe Cactus National Monument since December 6, 2002.

Table 8: Major Recent Incident Reports at Organ Pipe Cactus

Date	Incident
February 13, 2003	A man attempted to enter the United States from Mexico. During the inspection process, he assaulted and began struggling with a Customs inspector. The man drove away, dragging the inspector, who shot the driver. The vehicle continued north a short distance and ran off the road into the park. The driver died at the scene.
January 23, 2003	A ranger saw a full-size pickup stopped on Arizona 85, dropping off 10 to 15 suspected undocumented aliens. The ranger attempted a traffic stop, but the truck drove away at a high rate of speed, heading south towards Mexico. The ranger deployed road spikes before the truck traveled very far. The pickup was found abandoned about 0.75 mile south on the highway. The driver fled into the desert, but the Border Patrol apprehended about a dozen of the illegal immigrants. A check of the vehicle's VIN showed that it was stolen.
January 18, 2003	Rangers tracked a group of suspected drug smugglers into the park's backcountry. Ten people were taken into custody at gunpoint with the assistance of USBP agents and an Arizona National Guard helicopter. Ten backpacks containing a total of 40 packages of marijuana (461 pounds) were found nearby. Marijuana was also found on the men and at their camp.
January 5, 2003	A minivan traveling north on Arizona 85 turned around in traffic in front of a patrol car and headed south, reaching speeds up to 110 mph. The registration showed it had been stolen. Rangers spiked the van's tires, but the van traveled another 0.5 mile before leaving the highway and continuing another 0.1 mile off-road, causing significant resource damage before stopping. Eight undocumented aliens were arrested and turned over to the Border Patrol. The driver and five undocumented aliens escaped into the desert. Assisting agencies included the Border Patrol and Customs. Northbound traffic was stopped at the Lukeville port of entry for safety reasons.
December 5, 18, 2002	Rangers checking an illegal road created by smugglers encountered two vehicles, both of which turned and fled south. The second vehicle was disabled with tire spikes and later found abandoned on the Red Tanks trail system. A similar incident occurred on December 18 on the same road, also culminating in the seizure of an abandoned truck. Both vehicles had been stolen in San Diego and were being used to smuggle illegal aliens and possibly drugs on a daily basis for over three weeks. These smuggling operations caused damage to over 10 miles of trail in the Victory Mine, Senita Basin, and Red Tanks Tanaja trail systems. The smugglers had been using the trails as part of their road system.
December 17, 2002	Rangers stopped an SUV pulling a box trailer. The truck had been stolen. All three occupants were taken into custody at gunpoint. The trailer was registered to one of the passengers. A hidden compartment contained 29 packages of marijuana weighing over 463 pounds. Assisting agencies included Customs and Border Patrol.
December 1, 2002	Rangers stopped a vehicle for illegal entry. The driver had neither a license nor proof of insurance. A warrants check showed a felony warrant had been issued for a narcotics violation. A false compartment had 48 bundles of marijuana weighing a total of 108 pounds. Both occupants of the vehicle were arrested.

Table 9 shows the number of illegal border related incidents at the monument during 2002. During the public scoping process for this project, five out of 81 individuals wrote that they are currently afraid to visit the park units due to safety concerns.

Table 9: 2002 Border-Related Incidents at Organ Pipe Cactus

Stolen vehicles driven through park	19
Failure to yield	24
Narcotics	39
Undocumented Aliens	61
Abandoned vehicles	29
Incursions	5
Off-road driving	13
Miscellaneous	3
Murder	1
Total	194

In Table 9 the undocumented alien statistics refers to one specific incident that could involve several individuals. For example, 20 illegal aliens may be apprehended during a single instance. A single incursion may also involve several events. In addition, the table only shows incidents that park staff were involved with and are aware of.

ENVIRONMENTAL CONSEQUENCES

METHODOLOGY AND INTENSITY THRESHOLDS

Incident records at Organ Pipe Cactus National Monument were used to estimate the effects of the alternatives. Major incidents or an incident that resulted in personal injury or property loss was recorded and investigated. The thresholds of change for the intensity of an impact are defined as follows:

- Negligible:* Public health and safety would not be affected, or the effects would be at low levels of detection and would not have an appreciable effect on public health or safety.
- Minor:* The effect would be detectable and would likely be short-term, but would not have an appreciable effect on public health or safety. If mitigation was needed, it would be relatively simple and would likely be successful.
- Moderate:* The effects would be readily apparent and long term, and they would result in substantial, noticeable effects to public health and safety on a local to regional scale. Mitigating measures would probably be necessary and would likely be successful.
- Major:* The effects would be readily apparent and long term, and they would result in substantial, noticeable effects to public health and safety on a regional to national scale. Extensive mitigation measures would be needed, and their success would not be guaranteed.

IMPACTS OF ALTERNATIVE A: THE NO-ACTION ALTERNATIVE

Under alternative A the National Park Service would take no additional action to prevent vehicles from illegally entering the monument. Incident reports and discussions with monument staff indicate that park rangers repeatedly put their lives at risk in pursuit of drug and human smugglers, as indicated in Table 8. Such incidents are not rare occurrences, but take place three or four times each month. As long as smuggling continues to be a viable business, park staff and visitors would continue to be at risk. Therefore, impacts to human health and safety would be adverse, short and long term, and moderate. If trends in illegal activity continued, as indicated in Figure 14, impacts would probably worsen over the long term.

Cumulative Impacts

Because of the North American Free Trade Agreement, the Lukeville port of entry may open 24-hours a day, and park rangers would be staffed 24-hours a day (see page 51). Therefore, threats from illegal activity would increase since rangers would be required to be on duty more often, and no direct measures would be taken under this alternative to ensure their safety.

Taken alone, increased patrol and prevention methods planned by the Border Patrol (see page 51) would likely not be wholly successful in stopping illegal vehicle use. Long-term cumulative impacts would be beneficial, but only negligible in effect because rangers would be staffed around the clock, and illegal activity is expected to increase, as indicated in Figure 14.

Under the no-action alternative, impacts would be adverse, long term, and moderate. When combined with reasonably foreseeable future actions, cumulative impacts would be adverse, long term, and moderate, because no direct measures would be taken to protect human health and safety.

Conclusion

Impacts to human health and safety would be adverse, long term, moderate. If trends in illegal activity continue as anticipated, long-term impacts would worsen. Cumulative impacts would be adverse, long term, moderate.

IMPACTS OF ALTERNATIVE B: THE PREFERRED ALTERNATIVE

Installing a vehicle barrier would help reduce the amount of illegal vehicles entering the park. In the Lukeville area the barrier would consist of steel tubing bollards filled with concrete, which would be anchored in cement footings. Initial design estimates indicate that it takes approximately 1 hour to cut the rail-on-post barrier. The barrier would be structurally adequate to resist impacts from a 7,000-pound vehicle hitting the barrier at 40 miles per hour.

Drug smugglers could continue to devise methods for defeating the vehicle barrier (R. Stinson, NPS, pers. comm., P. Steinholtz, URS, Jan. 23, 2003), particularly in areas where it would be easier to breach. The vehicle barrier would provide beneficial, short- and long-term, moderate impacts unless drug smugglers devised methods to breach the barrier, which could reduce long-term benefits.

Cumulative Effects

Installing a pedestrian barrier near the port of entry and LORIScopes (see page 51) would deter illegal entry into the park to some degree, increasing the safety of park staff and visitors and resulting in beneficial, long-term, moderate impacts.

Both the U.S. Border Patrol and the National Park Service would benefit from the additional protection provided by a vehicle barrier, perhaps allowing them to concentrate enforcement efforts on other illegal activities. Impacts to visitor and park staff health and safety are expected to be beneficial, long term, and moderate.

Because of the North American Free Trade Agreement, the Lukeville port of entry may open 24-hours a day, with park rangers working 24 hours a day (see page 51). Therefore, threats from illegal activity would increase as rangers would be required to be on staff more often, possibly diminishing the protective measures afforded by the vehicle barrier.

Under the preferred alternative, impacts would be beneficial, long term, and moderate. When combined with reasonably foreseeable future actions, cumulative impacts would be beneficial, long term, and moderate, because no direct measures would be taken to improve human health and safety.

Conclusion

The vehicle barrier would provide beneficial, long-term, moderate impacts to human health and safety by reducing the amount of drug smuggling occurring by off-road vehicles. Cumulative impacts would be beneficial, long term, and moderate.

PARK MANAGEMENT AND OPERATIONS

AFFECTED ENVIRONMENT

During winter of 2002 Organ Pipe Cactus had 32 full-time equivalent employees, including 7 permanent law enforcement rangers. The actual number of staff ranges from a high of 71 during the winter season to 34–36 during the summer. Approximately 9 new rangers are expected in 2003, and new rangers may be highly focused on the border region. The park receives money from the Special Emphasis Program Accounts (SEPA) to aid in drug law enforcement. These funds, which do not exceed \$10,000 per year, are primarily used to pay salaries for employees in targeted areas of special operations, such as surveillance. The monument also receives High Intensity Drug Trafficking Area (HIDA) funds, which provides \$40,000 per year for overtime pay. However, the amount of existing and projected additional park rangers is not sufficient to adequately handle the growing illegal activity that occurs in the monument (see Figure 14) (R. Stinson, NPS, pers. comm., P. Steinholtz, URS, Jan. 23, 2003).

Illegal vehicular activity is not limited to drivers entering the United States from the south. As previously discussed, individuals also attempt to smuggle firearms, engine parts, and other goods into Mexico, driving through the monument's backcountry to avoid the port of entry, creating the same type of problems (R. Stinson, NPS, pers. comm., P. Steinholtz, URS, Jan. 23, 2003).

One new maintenance position is expected to be filled in 2003 to assist with border-related maintenance issues, and two positions are expected in 2004. The monument is also receiving a crane truck to assist with vehicle barrier repairs at both Organ Pipe Cactus National Monument and Coronado National Memorial. Organ Pipe Cactus maintenance crews would also be responsible for vehicle barrier maintenance at both park units (B. Mikus, NPS, pers. comm., P. Steinholtz, URS, Jan. 30, 2003).

ENVIRONMENTAL CONSEQUENCES

METHODOLOGY AND INTENSITY THRESHOLDS

For the purpose of this analysis, park operations refers 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, and (2) the ability of park staff to protect and preserve resources given current funding and staffing levels. Park staff knowledge was used to evaluate the impacts of each alternative, and the evaluation is based on the current description of park operations presented above. Definitions of impact levels are as follows:

- Negligible:* Park operations would not be affected or the effect would be at or below the lower levels of detection.
- Minor:* The effect would be detectable, but would be of a magnitude that it 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 effect 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 effect 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 would 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: THE NO-ACTION ALTERNATIVE

Under alternative A the National Park Service would take no action to prevent vehicles from illegally entering the monument. If trends in illegal activity continued as indicated in Figure 14, short- and long-term effects would worsen because increases would be needed in park resources and funding in order to track and apprehend drug smugglers. The overall impact would be adverse, short and long term, and moderate.

Cumulative Impacts

Increased patrol and prevention methods (see page 51) would require more rangers and funding. Impacts would still be beneficial in the long term, but only negligible due to the expected continual increases in illegal activity, as indicated in Figure 14.

The Lukeville port of entry could open 24 hours a day (see page 51), requiring round-the-clock staffing by NPS rangers as well. Therefore, impacts to park management and operations would be substantial, requiring additional rangers and continuous staffing, resulting in an adverse, long-term, moderate impact.

Under the no-action alternative impacts would be adverse, long term, and moderate. When combined with reasonably foreseeable future actions, cumulative impacts would be adverse, long term, and moderate because no direct measures would be taken to improve park management and operations, and additional staff would likely be required.

Conclusion

Impacts would continue to worsen, with increases in park resources and funding required to track and apprehend drug smugglers. This would result in adverse, long-term, moderate impacts. Cumulative impacts would also be adverse, long term, and moderate.

IMPACTS OF ALTERNATIVE B: THE PREFERRED ALTERNATIVE

The presence of a vehicle barrier would help reduce the amount of illegal vehicular use in the national monument, resulting in beneficial, short-term, moderate impacts to park maintenance and law enforcement staff because they could focus efforts elsewhere.

The same amount of staffing and funding would likely be required, even with the presence of a vehicle barrier, in order to apprehend undocumented aliens and drug smugglers who operate on foot. Maintenance crews would be required to repair breaches in the barrier; however, the additional crew members projected for 2003 and 2004, as well as a crane, would be sufficient (B. Mikus, NPS, pers. comm., P. Steinholtz, URS, Jan. 30, 2003).

As described under "Human Health and Safety," illegal activities have substantially increased at the national monument since the late 1990s (see Figure 14). To effectively deal with such increases, proportionate increases in park law enforcement personnel would be required, which has not

happened. While the presence of the vehicle barrier would help protect park resources, visitors, and park staff, the number of rangers required to prevent illegal drug activities would continue to increase in order to keep pace with rising criminal activity.

Cumulative Effects

NPS rangers would continue to work with the Border Patrol to protect park resources and to apprehend illegal aliens and drug smugglers. Both agencies would benefit from the additional protection provided by a vehicle barrier, perhaps allowing them to concentrate enforcement efforts on other illegal activities, resulting in beneficial, long-term, moderate impacts to park management and operations.

If the Lukeville port of entry remained open 24 hours a day (see page 51), round-the clock staffing by NPS law enforcement rangers would also be required, possibly diminishing the protection afforded by a vehicle barrier. Therefore, impacts to park management and operations would be substantial, requiring additional rangers and continuous staffing, resulting in an adverse, long-term, moderate impact.

Under the preferred alternative, impacts would be beneficial, short- and long term, and moderate. When combined with reasonably foreseeable future actions, cumulative impacts would also be beneficial, long term, and moderate.

Conclusion

The presence of a vehicle barrier would result in beneficial, long-term, moderate impacts to park management and operations. Additional federal funding would continue to be required to fight drug smuggling that occurs on foot. The number of rangers required to prevent illegal drug activities would continue to increase to keep pace with rising criminal activity. Projected additions to maintenance crews would be sufficient to maintain the barrier. Cumulative impacts would be beneficial, long term, and moderate.

ADJACENT LANDS

AFFECTED ENVIRONMENT

Organ Pipe Cactus National Monument is bordered on the east by the Tohono O’odham Nation (population 11,000) and on the west by Cabeza Prieta National Wildlife Refuge. Of 81 public comments received during the public scoping process, 16 (about 20%) were concerned about the proposed barrier pushing illegal traffic onto neighboring lands.

TOHONO O’ODHAM NATION

The Hia-Ced O’odham and the Tohono O’odham are two tribes that comprise the Tohono O’odham Nation. The reservation complex consists of one large and two smaller reservations, totaling 2,855,894 acres comprising 11 political districts (NPS 1995). This reservation experiences problems with illegal pedestrian and vehicle traffic, as does the national monument. A major concern is that a vehicle barrier in Organ Pipe could increase illegal vehicular traffic east of the park into the Indian reservation.

An all-Indian Customs unit called the Shadow Wolves patrols the Tohono O’odham Reservation and is responsible for the 76 miles of border that the reservation shares with Mexico. Increased security at Arizona’s designated border crossings — Nogales and Sasabe to the east and Lukeville (within Organ Pipe Cactus National Monument) to the west — has pushed smugglers, both on foot and in trucks, toward the remote and less guarded desert in between. In April 2002 a group of officers was making an arrest when a smuggler tried to run down a Shadow Wolves agent (Wheeler 2003).

Between October 2001 and October 2002, this Border Patrol unit seized 108,000 pounds of illegal drugs, nearly half of all the drugs intercepted by Customs in Arizona. However, it is believed that the Shadow Wolves capture no more than 10% of the drugs that enter through the reservation. They feel that they need greater resources to combat this illegal drug activity (Wheeler 2003).

CABEZA PRIETA NATIONAL WILDLIFE REFUGE

The 860,00-acre Cabeza Prieta National Wildlife Refuge shares a 56-mile international border with Sonora, Mexico (Ajo, Arizona 1998). Over 90% of the refuge is wilderness, and no vehicular traffic is allowed except on designated public use roads (NPS 2001a).

The refuge has the lead for the recovery of the endangered Sonoran pronghorn. A wide variety of flora and fauna also occur, including saguaros, creosote, ironwood, ocotillo, bighorn sheep, Gila monsters, sidewinders, cactus wrens, Harris hawks, and the endangered lesser long-nosed bat. Archeological evidence of early human presence includes foot trails, petroglyphs, shells, and pottery. Part of the historic Camino del Diablo or “Devil’s Highway” passes through the refuge and is open to four-wheel drive vehicles (National Audubon Society 2003).

Most of Cabeza Prieta is within the air space of the Barry M. Goldwater Air Force Range, which is north of the refuge. Numerous low-flying aircraft cross Cabeza Prieta en route to air-to-air bombing and gunnery ranges. Low-level helicopter flights occur in the spring and the fall. Some military training exercises over Cabeza Prieta may require limitations on travel and short periods of closure to the public (NPS 2001a).

The following activities are prohibited: dumping of litter, sewage, or liquid waste; firearms, prospecting, removal, or disturbance of sand, rock, gravel, or minerals; excavating or removing objects of antiquity, cultural artifacts, or paleontological artifacts; trapping; collecting, possessing, molesting, disturbing, injuring, destroying, removal, or transportation of any plant, or animal, or part of the natural flora and fauna; and wood campfires (NPS 2001a).

The border fence in the wilderness area is a multi-strand (4 to 5 wires) barbed wire fence that is not wildlife-friendly (in order to keep livestock out). Sections of the fence are missing, and refuge staff expect stealing of the fence to continue. The eastern portion of the refuge (which borders Organ Pipe Cactus) is being impacted by drug and human smuggling and subsequent law enforcement activities. Staff at the refuge are concerned that a vehicle barrier being constructed at Organ Pipe Cactus that would terminate at the refuge would increase illegal activity there (R. DiRosa, NPS, pers. comm., P. Steinholtz, URS, Dec. 30, 2002).

ENVIRONMENTAL CONSEQUENCES

METHODOLOGY AND INTENSITY THRESHOLDS

The discussion of impacts on adjacent lands focuses on (1) effects on natural resources, (2) law enforcement requirements, and (3) the ability of agency staff to protect and preserve resources. Discussions with adjacent agencies were used to evaluate the impacts of each alternative, as well as describe current agency operations presented in the affected environment section. Definitions for levels of impacts are as follows:

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

IMPACTS OF ALTERNATIVE A: THE NO-ACTION ALTERNATIVE

Under alternative A the National Park Service would take no action to prevent vehicles from illegally entering the national monument from Mexico. Therefore, Organ Pipe Cactus National Monument, the Tohono O’odham Reservation, and Cabeza Prieta National Wildlife Refuge would continue to experience illegal vehicular activity at approximately the same rate as now, and activity could be expected to increase at each unit, resulting in adverse impacts for all land agencies. In the absence of quantifiable data, it is likely that impacts would be adverse, short and long term, and minor to moderate.

Cumulative Impacts

Continued USBP activities along the 60-foot easement paralleling the international border in the reservation and the wildlife refuge would result in beneficial, long-term, minor impacts. Reasonably foreseeable future actions include the USBP plans for increased protection in its Yuma and Ajo stations, which would include the Tohono O’odham Reservation, Organ Pipe Cactus National Monument, and Cabeza Prieta National Wildlife Refuge. Proposed projects within the Yuma station focus on the area near the city of San Luis and may not affect the wildlife refuge. The projects proposed for the Ajo station include those listed on page 51, and others that could occur in the reservation and the eastern section of the wildlife refuge. Such proposed actions would likely result in increased protection for all land management agencies, resulting in beneficial, long-term, minor impacts, depending on the extent of the projects.

Under the no-action alternative the impacts on land management agencies would be adverse, short and long term, and minor to moderate because of continued illegal vehicle use in border areas. When combined with reasonably foreseeable future actions, impacts would be beneficial, long term, and minor. Taken together, however, the cumulative beneficial impacts would likely be offset by adverse impacts related to more illegal activity all along the border, resulting in adverse, long-term, minor to moderate impacts.

Conclusion

Impacts under the no-action alternative from continued illegal vehicle use would be adverse, short and long term, and minor to moderate. Cumulative impacts would be adverse, long term, and minor to moderate.

IMPACTS OF ALTERNATIVE B: THE PREFERRED ALTERNATIVE

Tohono O’odham Reservation

Organ Pipe Cactus National Monument’s southeastern border follows the Sierra de Santa Rosa (see Figure 1), a natural barrier to illegal vehicular use between the monument and the Tohono O’odham Reservation. No official road parallels the border between Lukeville and the monument’s eastern border, such as Mexico Highway 2 west of Lukeville (also shown in Figure 1). However, unofficial dirt roads in Mexico east of Lukeville facilitate illegal border crossings between Lukeville and the monument’s eastern boundary (see Figure 13 and Figure 15).

Therefore, it is likely that vehicles currently crossing the monument’s boundary between Lukeville and the Sierra de Santa Rosa would seek access through the Tohono O’odham Reservation.

The U.S. Border Patrol estimates that 500 people per day (180,000 per year) and 700,000 pounds of drugs entered the United States illegally through Organ Pipe Cactus National Monument in 2000. It is not known how many of these people or how many pounds of drugs arrived by vehicle. However, in 2001 approximately 150 vehicles were abandoned in the park (see Figure 14).

Figure 15: Unpaved Mexican Road Paralleling the International Boundary

Because the actual number of vehicles illegally entering Organ Pipe Cactus National Monument is unknown, it is difficult to estimate the number of vehicles that would be rerouted through the Tohono O’odham Reservation. It is also difficult to determine how many drug smugglers would rather breach the monument’s barrier, rather than drive 15 miles east of Lukeville to reach the reservation. The presence of Arizona 85, which runs north-south through the national monument, likely makes Organ Pipe Cactus a preferred entryway because the highway provides more immediate entry into the United States. No similar highway exists on the Tohono O’odham Reservation, and intervening mountain ranges make Arizona 85 inaccessible from the reservation. The closest road is one heading south from Gu Vo, Arizona, which terminates near the border and approximately 5 miles east of Organ Pipe Cactus. In the absence of quantifiable data, it is likely that adverse impacts to the Tohono O’odham Reservation as a result of constructing a vehicle barrier in Organ Pipe Cactus National Monument would be adverse, long term, and moderate.

Cabeza Prieta National Wildlife Refuge

Mexico Highway 2 parallels the international boundary from Lukeville west to Arizona’s border with Baja, California, thus providing immediate access to the western part of the national monument and all of the national wildlife refuge (see Figure 1). Unlike the monument’s eastern boundary, which is mountainous and impedes travel, the topography between Mexico Highway 2 and the wildlife refuge is flat and open, and there is no natural barrier that would impede illegal vehicular traffic. In addition, drug smugglers would have much easier access to Arizona 85 if they entered Cabeza Prieta instead of the Tohono O’odham Reservation, because Puerto Blanco Drive, which accesses Arizona 85, is only 5 miles from the monument’s western border. Although the Quitobaquito Hills could provide an impediment to reaching Puerto Blanco Drive, a dirt road north and east of the hills would be accessible and connects with the drive (see Figure 1).

As described for the Tohono O’odham Reservation, it is difficult to quantifiably calculate the number of vehicles that would be rerouted onto the wildlife refuge. Of primary concern would be increased impacts to the Sonoran pronghorn, which exist west of Arizona 85 and throughout the

majority of the wildlife refuge (as shown in Figure 12, see page 72). In the absence of quantifiable data, it is likely that adverse impacts to Cabeza Prieta National Wildlife Refuge from a vehicle barrier in Organ Pipe Cactus National Monument would be adverse, long term, moderate.

Cumulative Impacts

Continued USBP activities along the 60-foot easement paralleling the border on the reservation and the wildlife refuge would result in beneficial, long-term, minor impacts. However, if illegal vehicular activities were rerouted from the monument onto adjacent lands, patrols might have to be increased in these areas.

Reasonably foreseeable future USBP actions would be the same as those described under alternative A. Such actions would likely result in increased protection for both land management agencies, resulting in beneficial, long-term, minor impacts, depending on the extent of the projects. However, if illegal vehicular activities were rerouted from Organ Pipe Cactus National Monument onto adjacent lands, the effectiveness of these proposed actions could diminish to negligible to the extent that neighboring land agencies experienced increased traffic.

Under the preferred alternative impacts would be adverse, long term, and minor to moderate. When combined with reasonably foreseeable future actions, cumulative impacts would be adverse, long term, and minor to moderate depending on the extent that illegal vehicle traffic from Organ Pipe Cactus was rerouted onto adjacent lands.

Conclusion

In the absence of quantifiable data, it is likely that impacts to the Tohono O'odham Reservation and Cabeza Prieta National Wildlife Refuge would be adverse, long term, and minor to moderate. Cumulative impacts would be adverse, long term, and minor to moderate depending on the extent that illegal vehicle traffic from Organ Pipe Cactus was rerouted onto adjacent lands as a result of the vehicle barrier.

Coronado National Memorial: Affected Environment and Environmental Consequences

METHODOLOGY FOR ASSESSING IMPACTS

Potential impacts at Coronado National Memorial are described in terms of type, context, duration, and intensity, as described for Organ Pipe Cactus National Monument. Intensity definitions are provided separately for each impact topic analyzed in this environmental assessment.

Present and reasonably foreseeable future actions that are considered under the cumulative impact analysis include the U.S. Border Patrol's plans to further modify the area along the international boundary. Plans that could affect Coronado National Memorial include the following (INS 2002):

- Continued access by law enforcement staff on East Forest Lane to the border in the southeastern portion of the memorial (see Figure 2).
- Install an all-weather road along the border (see Organ Pipe Cactus above). USBP employees do not currently patrol the park on a regularly scheduled basis (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002).
- Install a camera tower, similar to a LORIScope, at Montezuma Ranch; the tower would be permanent and monitored in Naco. The camera would be located approximately 0.5 mile from the border in a previously disturbed area (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002). The Border Patrol plans to install the camera between April and July 2003. The original plan specified an 80-foot tower; the National Park Service has asked for a 60-foot tower instead (G. Estrada, USBP, pers. comm., P. Steinholtz, URS, Dec. 18, 2002).

As described for Organ Pipe Cactus National Monument, an impact to any park resource or value would be more likely to constitute an impairment to the extent that it would have a major or severe adverse effect upon a resource or value whose conservation is:

- necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park;
- key to the natural or cultural integrity of the park; or
- identified as a goal in the park's general management plan or other relevant NPS planning documents.

A determination on impairment is made for each impact topic.

NATURAL RESOURCES

FLOODPLAINS

AFFECTED ENVIRONMENT

Drainage patterns within the memorial consist mainly of smaller, well-defined washes. During rainy seasons intense summer thunderstorms may cause flash flooding in the memorial. High water in ephemeral streams and dry washes could occur periodically and would be transient and highly variable. Precipitation is channeled through this system of washes into Montezuma Canyon and eventually to the San Pedro River basin. Perennial surface-flowing streams are nonexistent in the memorial.

The southeastern quarter of the memorial is a broad grassland plain dissected by numerous smaller drainages. Riparian zones are most distinctive in the main drainages, but permanent or semi-permanent water occurs only in a few isolated seeps and steel cattle tanks. The proposed vehicle barrier would cross one major wash in the Montezuma Canyon drainage. This 10-foot-wide wash is a deep, well defined drainage that crosses the border in the eastern portion of the memorial. This drainage, as with other larger channels in the Montezuma Canyon, carries water only during and after rainstorms. Channels below 5,000 feet (1,524 m) are classified in the mesquite series of Sonoran riparian and oasis forest. This area includes 224 acres (90 ha) and is dominated by Arizona white oak, desert willow, Emory oak, and honey mesquite (Ruffner and Johnson 1991). Some streams in the area were probably perennial before Tombstone began to divert streamflow for municipal use (Hoffmeister and Goodpaster 1954).

The memorial does not lie within a designated floodplain, and Federal Emergency Management Agency maps indicate that no analysis of flood hazards has been conducted in or around Coronado National Memorial (NPS 2002d).

The NPS *Procedural Manual #77-2: Floodplain Management* (NPS 2002e) provides agency-specific guidance for implementing Executive Order 11988 (“Floodplain Management”). According to the guideline, an action class and applicable regulatory floodplain must be identified for a proposed action that is either subject to possible harm from flooding or has the potential for adverse floodplain impacts.

A U.S. Army Corps of Engineers 404 permit would be necessary under the preferred alternative.

ENVIRONMENTAL CONSEQUENCES

Methodology and Intensity Thresholds

Analyses of the potential intensity of impacts to floodplains were derived from available information and park staff’s observations of the effects on floodplains from past construction activities. The thresholds of change for the intensity of impacts to floodplains would be the same as defined for Organ Pipe Cactus (see text box).

Impacts of Alternative A: The No-Action Alternative

There would be no impacts on the frequency and intensity of flood flows in the drainage systems under the no-action alternative. Illegal cross-country travel could increase in the future, possibly on undisturbed lands and washes, which could loosen soils and vegetation, resulting in accelerated

erosion. These would be short-term impacts. Increased illegal vehicular travel could cause adverse, long-term, negligible to minor impacts.

Cumulative Impacts

Future USPB plans to replace the existing border road within the 60-foot easement with an all-weather road could result in accelerated erosion within the larger stream channels. Impacts to floodplains would be adverse, long term, and minor to moderate in intensity. The actions associated with this project would not contribute to cumulative impacts associated with an all-weather access road.

Conclusion

There would be no impacts on the frequency and intensity of flood flows in the drainage systems under the no-action alternative. To the extent that illegal cross-country travel increased in the future, soils and vegetation on undisturbed lands and washes could be loosened, resulting in accelerated erosion. Cumulative impacts would be adverse, long term, and minor to moderate. The no-action alternative would not contribute to cumulative impacts.

Because there would be no major, adverse impacts to floodplains, there would be no impairment of park resources or values.

Alternative B: The Preferred Alternative

Constructing a vehicle barrier would have no impacts on the frequency and intensity of flood flows in the drainage systems. Impacts associated with cross-country travel would be eliminated or reduced. Minor improvements to an access road and removing some riparian vegetation in some drainage areas could have adverse impacts on soils and result in accelerated erosion and possibly widening of some channels. A road maintenance plan would be adhered to during construction and revegetation efforts would be combined with this plan to lessen impacts to soil erosion and floodplain erosion. In some cases flood flows could deposit woody debris against the vehicle barrier, and debris might need to be cleared from some areas as part of normal maintenance. Implementing a revegetation plan would help offset potential erosion impacts associated with flooding by stabilizing soils and the remaining vegetation on streambanks. Overall, impacts would be adverse, long-term, localized to certain areas, and minor to moderate.

Thresholds for Floodplain Impacts

Negligible: Floodplains would not be affected, or changes would be either non-detectable or if detected, would have effects that would be considered slight, local, and would likely be short-term.

Minor: Changes in floodplains would be measurable, although the changes would be small, would likely be short-term, and the effects would be localized. No mitigation measure associated with water quality or hydrology would be necessary.

Moderate: Changes in floodplains would be measurable and long term but would be relatively local. Mitigation measures associated with water quality or hydrology would be necessary, and the measures would likely succeed.

Major: Changes in floodplains would be readily measurable, would have substantial consequences, and would be noticed on a regional scale. Mitigation measures would be necessary, but their success would not be guaranteed.

Impairment: A major, adverse impact to a resource or value whose conservation is

- (1) necessary to fulfill specific purposes identified in the establishing 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 NPS planning documents

Cumulative Impacts

The Border Patrol plans to replace the existing border road that parallels the international border within the 60-foot easement with an all-weather road. A road maintenance plan would be adhered to during construction and revegetation efforts would combine with this plan to lessen impacts to soil erosion and floodplain erosion.

Construction and maintenance of the road could result in accelerated erosion within the larger stream channels. Impacts to floodplains would be adverse, long term, and minor to moderate in intensity. The actions associated with this alternative would contribute a negligible impact to impacts resulting from foreseeable future actions of an all-weather access road.

Conclusion

The vehicle barrier would have no impacts on the frequency and intensity of flood flows in the drainage systems; any impacts associated with cross-country travel would be eliminated, resulting in beneficial impacts. Adhering to a mitigation plan during construction, revegetating disturbed areas, and following a road maintenance plan would lessen impacts to floodplains. Overall, impacts would be localized to certain areas, adverse, long term, and minor to moderate. Cumulative impacts would be adverse, long term, and minor to moderate; proposed actions would have a negligible contribution to cumulative impacts.

Because there would be no major, adverse impacts to floodplains, there would be no impairment of park resources or values.

SOILS

AFFECTED ENVIRONMENT

The eastern area of the memorial is a broad, open plain dissected by numerous drainages that flow into the nearby San Pedro River. The proposed vehicle barrier would traverse a relatively flat section of the grasslands along the southern boundary of the park and cross the lower portion of the Montezuma Canyon drainage. The northern end would terminate in a short section of the modified barrier parallel to the Montezuma Canyon drainage (NPS 2003e). Soils in Coronado National Memorial are variable, with soil depths ranging from less than 20 inches on steeper slopes to more than 60 inches on lower slopes. Soils are typically high in rock fragments. Sandy looms and gravelly sandy loams represent the most frequent surface and subsurface textures. Other textures present include coarse sandy loam, clay loam, and gravelly clay (NPS 2002d).

Table 10 lists the soils in the memorial that would be affected by the preferred alternative and describes the associated slope, elevation, and ecological site. The majority of the affected area would be within the Gardencan-Larque complex, with a small portion of the proposed barrier extending into the Gardencan-Terrarossa complex. The Montcan-Amuzet-Riverwash complex constitutes a very small area following Deep Wash.

The erosion factor (K), as shown in Table 10, indicates the susceptibility of a soil to sheet and rill erosion by water. The higher the value, the more susceptible the soil is to sheet and rill erosion by rain (K values range from 0.02 to 0.69). Wind erodibility indicates the susceptibility of soil to wind erosion, and the lower the value, the less susceptible is the soil to erodibility.

Table 10: Soil Characteristics — Coronado National Memorial

Soil Type	Slope Range	Erosion Factor K	Wind Erodibility Group
Gardencan-Larque complex — shallow hills, sandy loam upland	0–5%	0.05–0.28	3
Gardencan-Terrarossa complex — loamy upland	2–18%	0.05–0.32	5–6
Montcan-Amuzet-Riverwash complex — sandy bottom	3–5%	0.02–0.15	2–5

SOURCE: NRCS 1996.

ENVIRONMENTAL CONSEQUENCES

Methodology and Intensity Thresholds

Analyses of the potential intensity of impacts to soils were derived from the available soils information and park staff's past observations of the effects on soils from construction activities. The impact thresholds would be the same as those used for Organ Pipe Cactus and are repeated in the text box.

Impacts of Alternative A: The No-Action Alternative

Under this alternative no action would be taken to prevent vehicles from illegally entering the monument from Mexico. No impacts to soils have yet been identified from illegal vehicle use; however, the potential exists for such use to compact and disturb soils in off-road areas, as well as make them susceptible to erosion. Continued impacts to soils would be adverse, long term, and negligible to minor depending on the extent to which illegal off-road vehicle use occurred.

Cumulative Impacts

Previous and continued driving along the border road and East Forest Lane for protection purposes has compacted soils and caused dust.

Future USBP plans to improve this road by replacing it with an all-weather road could contribute to adverse, short-term, minor impacts in this area. However, impacts of an all-weather road in the long term would be beneficial. It is assumed a camera tower, which would help deter illegal entries into the memorial, would be placed on a 12-foot-square concrete pad in a previously disturbed area, with an adverse, long-term, negligible impacts on soils. Overall, impacts to soils would be adverse, long term, and negligible, depending on the scope of the potential actions and mitigation measures followed.

Soil Impact Thresholds

Negligible: The impact would be at the lowest levels of detection and would cause very little or no physical disturbance /removal, compaction, or increased erosion, when compared with current conditions.

Minor: The impact would be slight but detectable in some areas, with few perceptible effects of physical disturbance/removal, compaction, or increased erosion of soils.

Moderate: The impact would be readily apparent in some areas and would have measurable effects in terms of physical disturbance/removal, compaction, or increased erosion.

Major: The impact would be readily apparent in several areas and would have severe effects in terms of physical disturbance/removal, compaction, or increased erosion.

Impairment: A major, adverse impact to a resource or value whose conservation is

- (1) necessary to fulfill specific purposes identified in the establishing 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 NPS planning documents.

Under the no-action alternative, impacts would be adverse, long term, and negligible to minor depending on the extent to which illegal off-road vehicle use occurred. When combined with reasonably foreseeable future actions, cumulative impacts would be adverse, long term, and negligible to minor.

Conclusion

Impacts to soils could potentially occur from illegal vehicles accessing the memorial, resulting in adverse, long-term, negligible to minor impacts. Cumulative impacts to soils and erosion would be adverse, long term, and negligible to minor.

Because there would be no major, adverse impacts to soils, there would be no impairment of park resources or values.

Impacts of Alternative B: The Preferred Alternative

Constructing a fence under this alternative would result in soil disturbance for post hole excavation. Soils would also be compacted and disturbed by the presence of construction equipment and workers. Local soil compaction would temporarily decrease permeability, alter soil moisture, and diminish the water storage capacity of the soils. However, activities would be confined to the 60-foot easement that parallels the border, as well as East Forest Lane. Special attention would be given to wash crossings and culverts in these areas, as defined in a road maintenance plan. All staging and stockpiling would occur in previously disturbed areas. Impacts related to construction activities would be adverse, short term, and moderate.

Dust would be generated by construction equipment, and excavated material would be susceptible to wind erosion, but the amount of soil excavated would be minimal. The top 6 to 8 inches of soil would be stored in the two turnaround areas. Salvaged surface soils would be returned to the disturbed site, and seeds of vascular and non-vascular plants would be replaced (S. Rutman, NPS, pers. comm., P. Steinholtz, URS, Feb. 5, 6, 2003).

Construction would occur primarily in the Gardencan-Larque complex, which has a minimal to moderate erosion factor and minimal wind erodibility. Construction would be limited in the other two soil types, which also have minimal or minimal to moderate erosion factors and minimal to moderate wind erodibility. Impacts to soils from erosion would be adverse, long term, and negligible.

Overall impacts to soils would be adverse, short-term, and moderate due to construction activities, and adverse, long term, and negligible due to erosion.

Cumulative Effects

Previous and continued driving along East Forest Lane and the border road has resulted in soil compaction and dust. USBP agents as well as construction vehicles would continue to drive on this road during barrier construction, resulting in adverse, short-term, negligible impacts. Future USBP plans to improve this road by replacing it with an all-weather road could also contribute short-term impacts to this area. However, beneficial, long-term impacts would result from the presence of a camera tower, which could help deter illegal entries into the memorial. Therefore, impacts to soils and erosion would be adverse, long term, and negligible to minor, assuming the application of mitigation measures during construction.

Under the preferred alternative, impacts would be adverse, short-term, and moderate due to construction activities, and adverse, long term, and negligible due to erosion. When combined with reasonably foreseeable future actions, cumulative impacts would be adverse, long term, and negligible to minor.

Conclusion

Impacts to soils related to construction activities would be adverse, short term, and moderate. Impacts to soils from erosion would be adverse, long term, and negligible. Cumulative impacts to soils would be adverse, long term, and negligible to minor.

Because there would be no major, adverse impacts to soils, there would be no impairment of park resources or values.

VEGETATION

AFFECTED ENVIRONMENT

The vegetation in Coronado National Memorial was surveyed and mapped in 1991. Steep, wooded terrain predominates in the western area of the memorial, while the eastern portion is a broad, open plain dissected by numerous drainages (NPS 2003e). Vegetation was classified into biotic communities, and a determination of acreage was made for each biotic community (Ruffner and Johnson 1991). Four plant associations have been identified in the area. Of these associations, the grama mixed grass / mixed scrub and the honey mesquite / mixed short tree exist along the international border in the area of the proposed vehicle barrier (NPS 2002d).

The grama species mixed grasses-mixed scrub association is primarily a Chihuahuan semidesert grassland community dominated by perennial grasses and shrubs. This association encompasses over 1,000 acres in the eastern third of the memorial. Characteristic plant species include fairy duster (*Calliandra eriophylla*), rabbit brush (*Chrysothamnus nauseosus*), hedgehog cactus (*Echinocereus pectinatus*), Palmer agave (*Agave palmeri*), Lehmann lovegrass (*Eragrostis lehmanniana*), and blue grama (*Bouteloua gracilis*). Arizona white oak (*Quercus arizonica*), Emory oak (*Q. Emoryi*), and honey mesquite (*Prosopis glandulosa*) are scattered throughout the habitat (NPS 2002a, 2002d).

The honey mesquite / mixed short tree association is a Sonoran Desert riparian forest that typically occurs below 3,900 feet and is restricted to streams, springs, ephemeral drainages, and areas that have a shallow water table. Trees usually do not form a closed canopy in this association. This association is a minor biotic community in the memorial. It covers only 224 acres and occurs in the eastern third of the park along drainages of lower Montezuma Canyon. Typical species of this association include Arizona white oak, desert willow (*Chilopsis linearis*), Emory oak, honey mesquite, poison ivy (*Rhus radicans*), rabbit brush, sumac (*Rhus virens*), cane cholla (*Opuntia spinosior*), Lehmann lovegrass, and side oats grama. Relatively dense stands of desert willow and occasional honey mesquites are scattered along drainages in the southeastern corner of the memorial (NPS 2002a, 2002d).

Lehmann lovegrass is an exotic plant at Coronado that often becomes established in disturbed areas (B. Alberti, NPS, pers. comm., P. Steinholtz, URS, Dec. 10, 2002). Lehmann lovegrass, a species introduced from South Africa, appears to be spreading naturally throughout much of southern Arizona to the detriment of more palatable native grasses (NPS 2002a).

Park staff at Coronado have established nine long-term agave monitoring plots where the effects of grazing are studied. Two plots are close to the memorial's eastern area, near the international border.

ENVIRONMENTAL CONSEQUENCES

Methodology and Intensity Thresholds

All available information on known vegetation in the memorial was compiled. Where possible, information from field studies of vegetation and observations of exotic species were compared with the immediate area at and surrounding the international border. Predictions about short- and long-term site impacts were based on previous studies of visitor impacts to vegetation in the memorial. Impact thresholds are the same as for Organ Pipe Cactus and are defined in the text box.

Vegetation Impact Thresholds

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 a large number of individuals of a species or resource. The change would be measurable and would result in a severely adverse or major beneficial impact, and a possible permanent consequence, on 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 establishing 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 NPS planning documents

Impacts of Alternative A: The No-Action Alternative

Under this alternative no action would be taken to prevent illegal vehicular use through the memorial. Adverse, short- and long-term, negligible to minor impacts to vegetation could be caused by illegal vehicle use in the memorial. To the extent that such use occurred, the grama species mixed grasses / mixed scrub community would be impacted the most due to its predominance in the southeastern section of the memorial.

The existence of nonnative vegetation would continue to be a problem at the memorial, and they could enter the monument on illegal vehicles traveling from Mexico. Impacts to native vegetation from the introduction or spread of nonnative species would be adverse, short term, and negligible. Overall impacts to vegetation would be adverse, long term, and negligible to minor.

Cumulative Impacts

While the presence of a USBP camera tower could improve protection of vegetation in the area by deterring illegal vehicle use, it would not prevent such vehicles from entering the park. Replacing the border road with an all-weather road could adversely impact vegetation in the short term, depending on the mitigation that was used; the impact of construction activities would be adverse, short term,

and minor. An all-weather road could help reduce future impacts on vegetation by confining travel to a specific corridor, resulting in a beneficial impact.

Under the no-action alternative impacts would be adverse, long term, and negligible to minor. When combined with reasonably foreseeable future actions, cumulative impacts would be adverse, long term, and minor.

Conclusion

Illegal vehicular use in the memorial could damage vegetation, resulting in adverse, long-term, negligible to minor impacts. Cumulative impacts would be adverse, long term, and minor.

Because there would be no major, adverse impacts to vegetation, there would be no impairment of park resources or values.

Impacts of Alternative B: The Preferred Alternative

The project area for a vehicle barrier is composed almost entirely of the grama species mixed grasses / mixed scrub association. A revegetation plan would minimize short-term impacts to affected the species by locating construction staging areas where vegetation is minimal (primarily outside of the park or in previously disturbed areas), reducing the width of the construction area, and salvaging and replanting species that would be disturbed by construction elsewhere within the memorial.

Proposed mitigation would require that disturbed and restored areas be continually monitored to eradicate invasive plants along the border as they colonize. The road maintenance plan, which would define procedures for reducing the introduction of invasive species by means of construction equipment, would be adhered to during construction. Impacts to native vegetation from the introduction or spread of nonnative species would be adverse, short term, and negligible.

Under this alternative construction-related impacts would be adverse, short term, and negligible because vegetation would be salvaged and replanted, and only a small area of the memorial (1 mile) would be affected. Beneficial, long-term, negligible to minor impacts would result due to the potential prevention of damage to vegetation from future illegal vehicle use in the memorial.

Cumulative Effects

The camera tower would be located outside the area of proposed activity at a previously disturbed site. Therefore, no or negligible adverse, short-term impacts related to construction would occur. Beneficial, long-term, minor impacts to vegetation could occur as a result of increased protection, especially in conjunction with a vehicle barrier. Plans to improve the border road could adversely impact vegetation in the short and long term, depending on mitigation measures followed, such as a revegetation plan; the impact of construction activities would be adverse, short term, and minor. An all-weather road could help reduce future impacts on vegetation by confining travel to a specific corridor, resulting in a beneficial impact.

Under the preferred alternative construction-related impacts would be adverse, short term, and negligible; once the barrier was in place, impacts on vegetation would be beneficial, long term, and negligible to minor. When combined with reasonably foreseeable future actions, cumulative impacts would be beneficial, long term, and minor.

Conclusion

Under alternative B impacts to vegetation as a result of construction activities would be adverse, short-term, and negligible. Beneficial, long-term, negligible to minor impacts would result from the potential prevention of illegal vehicular activity in the memorial. Cumulative impacts would be adverse, short-term, and negligible; cumulative long-term impacts to vegetation would be beneficial and minor.

Because there would be no major, adverse impacts to vegetation, there would be no impairment of park resources or values.

WILDLIFE

AFFECTED ENVIRONMENT

For its size, Coronado National Memorial has a great diversity of wildlife species. This is likely due to the presence of thick grassland vegetation; the memorial's location in the Sky Island ecosystem; and its connection to other natural areas nearby, including Coronado National Forest, the San Pedro River, and undeveloped areas in Mexico (Swann et al. 2000).

Recent inventories of the vertebrate fauna have identified 33 reptile and 5 amphibian species, 11 bat and 43 terrestrial mammal species, and 190 species of birds in memorial (Cockrum et al. 1979; Swann et al. 2000; Petryszyn and Alberti n.d.; plus unpublished memorial observation data). Table 11 lists species that could occur in the project area.

Table 11: Wildlife Species that May Occur in Project Area — Coronado National Memorial

Marsupials		Carnivores (cont.)	
Virginia opossum	<i>Didelphis virginiana</i>	Hooded skunk	<i>Mephitis macroura</i>
Insectivores		Striped skunk	<i>Mephitis mephitis</i>
Desert shrew	<i>Notiosorex crawfordi</i>	White-nosed coati	<i>Nasua narica</i>
Bats		Common raccoon	<i>Procyon lotor</i>
Mexican long-tongued bat	<i>Choeronycteris mexicana</i>	Western spotted skunk	<i>Spilogale gracilis</i>
Lesser long-nosed bat	<i>Leptonycteris curasoae</i>	American badger	<i>Taxidea taxus</i>
Townsend's big-eared bat	<i>Plecotus townsendii</i>	Common gray fox	<i>Urocyon cinereoargenteus</i>
Big brown bat	<i>Eptesicus fuscus</i>	Black bear	<i>Ursus americanus</i>
Hoary bat	<i>Lasiurus cinereus</i>	Hooved Mammals	
Western pipistrelle	<i>Pipistrellus hesperus</i>	Whitetail deer	<i>Odocoileus virginianus</i>
California myotis	<i>Myotis californicus</i>	Mule deer	<i>Odocoileus hemionus</i>
Western small-footed myotis	<i>Myotis ciliolabrum</i>	Collared peccary	<i>Tayassu tajacu</i>
Fringed myotis	<i>Myotis thysanodes</i>	Amphibians	
Southwestern cave myotis	<i>Myotis velifer</i>	Great Plains toad	<i>Bufo cognatus</i>
Rabbits and Hares		Red-spotted toad	<i>Bufo punctatus</i>
Black-tailed jackrabbit	<i>Lepus californicus</i>	Woodhouse's toad	<i>Bufo woodhousii</i>
Desert cottontail	<i>Sylvilagus audubonii</i>	Canyon treefrog	<i>Hyla arenicolor</i>
Eastern cottontail	<i>Sylvilagus floridanus</i>	New Mexico spadefoot	<i>Spea multiplicata</i>
Rodents		Reptiles	
Rock squirrel	<i>Spermophilus variegatus</i>	Ornate box turtle	<i>Terrapene ornata</i>
Spotted ground squirrel	<i>Spermophilus spilosoma</i>	Sonoran spotted whiptail	<i>Cnemidophorus sonorae</i>
Botta's pocket gopher	<i>Thomomys bottae</i>	Desert grassland whiptail	<i>Cnemidophorus uniparens</i>
Southern pocket gopher	<i>Thomomys umbrinus</i>	Great Plains skink	<i>Eumeces obsoletus</i>
Rock pocket mouse	<i>Chaetodipus intermedius</i>	Madrean alligator lizard	<i>Elgaria kingii</i>
Desert pocket mouse	<i>Chaetodipus penicillatus</i>	Lesser earless lizard	<i>Holbrookia maculata</i>
Ord's kangaroo rat	<i>Dipodomys ordii</i>	Short-horned lizard	<i>Phrynosoma douglasii</i>

Banner-tailed kangaroo rat	<i>Dipodomys spectabilis</i>	Clark's spiny lizard	<i>Sceloporus clarkii</i>
Merriam's kangaroo rat	<i>Dipodomys merriami</i>	Yarrow's spiny lizard	<i>Sceloporus jarrovi</i>
Hispid pocket mouse	<i>Chaetodipus hispidus</i>	Bunch grass lizard	<i>Sceloporus sleevei</i>
Silky pocket mouse	<i>Perognathus flavus</i>	Prairie lizard	<i>Sceloporus undulatus</i>
Northern pygmy mouse	<i>Baiomys taylori</i>	Tree lizard	<i>Urosaurus ornatus</i>
White-throated woodrat	<i>Neotoma albigula</i>	Gila monster	<i>Heloderma suspectum</i>
Southern grasshopper mouse	<i>Onychomys torridus</i>	Western diamondback rattlesnake	<i>Crotalus atrox</i>
Deer mouse	<i>Peromyscus maniculatus</i>	Rock rattlesnake	<i>Crotalus lepidus</i>
White-footed mouse	<i>Peromyscus leucopus</i>	Blacktail rattlesnake	<i>Crotalus molossus</i>
Brush mouse	<i>Peromyscus boylii</i>	Mojave rattlesnake	<i>Crotalus scutulatus</i>
Western harvest mouse	<i>Reithrodontomys megalotis</i>	Ringneck snake	<i>Diadophis punctatus</i>
Fulvous harvest mouse	<i>Reithrodontomys fulvescens</i>	Western hognose snake	<i>Heterodon nasicus</i>
Arizona cotton rat	<i>Sigmodon arizonae</i>	Night snake	<i>Hypsiglena torquata</i>
Tawny-bellied cotton rat	<i>Sigmodon fulviventris</i>	Sonoran whipsnake	<i>Masticophis bilineatus</i>
Yellow-nosed cotton rat	<i>Sigmodon ochrogathus</i>	Coachwhip	<i>Masticophis flagellum</i>
Carnivores		Western coral snake	<i>Micruroides euryxanthus</i>
Ringtail	<i>Bassariscus astutus</i>	Gopher snake	<i>Pituophis catenifer</i>
Coyote	<i>Canis latrans</i>	Big Bend patchnose snake	<i>Salvadora deserticola</i>
Common hog-nosed skunk	<i>Conepatus mesoleucus</i>	Chihuahuan blackheaded snake	<i>Tantilla wilcoxi</i>
Mountain lion	<i>Puma concolor</i>	Chihuahuan hooknosed snake	<i>Gyalopian canum</i>
Bobcat	<i>Lynx rufus</i>	Lyre snake	<i>Trimorphodon biscutatus</i>

The majority of bird species in the memorial inhabit deciduous forests and woodlands or mountains, which do not exist in the area of the proposed vehicle barrier. The Rufous-winged sparrow (*Aimophila carpalis*) seeks grasslands mixed with thorn bushes, mesquite trees, or cholla patches. Other sparrows, such as the Rufous-crowned sparrow (*Aimophila ruficeps*), prefer treeless dry uplands with grassy vegetation and bushes, often near rocky outcrops, and open oak woodlands (eNature.com 2003). The common raven can be found in deserts, coniferous forests, and arid mountains (eNature.com 2003).

Raptors, including red-tailed hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter cooperii*), and American kestrel (*Falco sparverius*), are present, but few observations have been recorded in the memorial (NPS 2002b).

A small mammal monitoring plot exists near the border (see Figure 2).

ENVIRONMENTAL CONSEQUENCES

Methodology and Intensity Thresholds

To determine impacts, all available information on known wildlife was compiled. Predictions about short- and long-term site impacts were based on existing data from Coronado National Memorial. Impacts thresholds would be the same as for Organ Pipe Cactus and are shown in the text box.

Impacts of Alternative A: The No-Action Alternative

Under the no-action alternative, no action would be taken to prevent vehicles from illegally entering the memorial from Mexico. To the extent the illegal vehicle use occurred, impacts would be adverse, long term, and negligible to minor due to damaged habitat and disturbance. Wildlife in the gramma species mixed grasses / mixed scrub habitat would likely be most affected, because it comprises the majority along the eastern end of the international border.

Long-term impacts to wildlife habitat from the introduction or spread of nonnative species as a result of illegal vehicle use would continue to be adverse and negligible to minor.

The existing border fence would continue to be a barrier to the movement of large mammals, creating adverse, long-term, minor impacts to wildlife movement.

Overall impacts to wildlife would be adverse, short and long term, and negligible to minor.

Cumulative Impacts

To the extent that the camera tower would provide additional protection and deter illegal vehicle use, long-term impacts to wildlife would be beneficial. However, the camera tower would not prevent vehicles from illegally entering the memorial. Plans to replace the border road could have adverse impacts to wildlife habitat, depending on construction activities and what types of mitigations were taken to protect habitat. Overall impacts would be beneficial, long term, and negligible.

Under the no-action alternative impacts would be adverse, short and long term, negligible to minor. When combined with reasonably foreseeable future actions, cumulative impacts would be adverse, long term, and minor because no direct measures would be taken to protect wildlife.

Conclusion

Damage to wildlife habitat and disturbance to wildlife would continue, resulting in adverse, long-term, negligible to minor impacts to wildlife in the grama species mixed grasses / mixed scrub habitat. Cumulative impacts would be adverse, long term, and minor.

Because there would be no major, adverse impacts to wildlife or wildlife habitat, there would be no impairment of park resources or values.

Impacts of Alternative B: The Preferred Alternative

Not all wildlife habitats would be affected by the construction of a vehicle barrier along the border. The area of proposed impact consists almost entirely of the grama species mixed grasses / mixed scrub habitat. Wildlife using this habitat would most likely be affected (see Table 11).

Wildlife Impact Thresholds

Negligible: An action 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 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 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 would have a noticeable change to a population or large number of 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 establishing 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 NPS planning documents.

The wildlife habitat that would be lost is extensive in Arizona and loss of this habitat would not result in any substantial reduction in breeding opportunities for birds and other animals on a regional scale.

During construction, most wildlife in the construction area would be displaced to the surrounding areas. Direct mortality of small mammals and reptiles could occur during construction. If existing vegetation was cleared during the nesting season of migratory birds, loss of nests and eggs and mortality of nestlings could occur. Construction activities would cause noise and dust, which would also interrupt foraging and breeding activities of birds and other animals in proximity to the construction site. Because illegal smuggling activities have degraded the existing wildlife habitat along the border, the impacts to wildlife as a result of these construction activities would be adverse, short term, and negligible to minor.

Beneficial, long-term, minor impacts would result from the reduction or prevention of illegal vehicular activity in the memorial, which would help protect wildlife habitat. Disturbance to wildlife due to vehicular noise and dust would also be reduced or prevented; the beneficial long-term impacts would be greatest for nocturnal species since most illegal vehicular activity occurs at night.

Impacts to wildlife from the introduction or spread of nonnative species would be adverse and negligible. Increases in the existing lovegrasses could indirectly decrease the numbers of small mammals, such as the Hispid pocket mouse and Western harvest mouse (Bock and Bock, 1996). Decreases in small mammal abundance could therefore decrease the prey base for raptors.

Overall, impacts to wildlife would be adverse, short term, and negligible to minor; long-term impacts would be beneficial and minor.

Cumulative Impacts

The proposed camera tower would be located outside the area of proposed activity in a previously disturbed site. Beneficial, long-term, minor impacts to wildlife could result from additional protection provided by the camera, especially when combined with the presence of a vehicle barrier. However, plans to replace the border road could have adverse, primarily short-term, negligible to minor impacts to wildlife habitat, depending on the extent of construction activities and revegetation efforts. Therefore, impacts would be beneficial, long term, and minor.

Under the preferred alternative impacts would be beneficial, long term, and minor. When combined with reasonably foreseeable future actions, cumulative impacts would be beneficial, long term, and minor.

Conclusion

Impacts on wildlife and wildlife habitat from construction activities would be adverse, short term, and negligible. The potential reduction or prevention of illegal vehicular activity would result in beneficial, long-term, minor impacts. Cumulative impacts would be beneficial, long term, and minor.

Because there would be no major, adverse impacts to wildlife or wildlife habitat, there would be no impairment of park resources or values.

THREATENED, ENDANGERED, AND SENSITIVE SPECIES

AFFECTED ENVIRONMENT

Several species identified as sensitive at the federal or state level are known to exist or may exist in Coronado National Memorial. The U.S. Fish and Wildlife Service provided a list of threatened, endangered, proposed, and candidate species for Cochise County in March 2000. Many of these species do not inhabit the memorial because it does not provide suitable habitat. Other species observed in the memorial have been extirpated or have not been recorded in the area for many years. Table 12 lists the four wildlife species that are on the USFWS list that probably exist in the memorial (NPS 2002d).

Table 12: Special Status Species that May Exist in Coronado National Memorial

Common Name	Scientific Name	Federal Status	State Status
Lesser long-nosed bat	<i>Leptonycteris curasoae</i>	Endangered	Species of Concern
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened	Species of Concern
Mexican long-tongued bat	<i>Choeronycteris mexicana</i>	Species of Concern	Species of Concern
Loggerhead shrike	<i>Lanius ludovicianus</i>	Species of Concern	No status

Source: USFWS 2000.

Arizona lists two species of concern that are known to exist in the memorial — the barking frog and the elegant trogon. The barking frog habitat exists in the northeast quadrant and throughout the western portion of the memorial, but not in the southeastern grasslands where the proposed vehicle barrier would be located. The trogons are associated with woodlands and riparian areas, not the southeastern grasslands (B. Alberti, pers. comm., P. Steinholtz, URS, Dec. 3, 2002).

Threatened, endangered, proposed, or candidate fauna known to have existed historically in Coronado National Memorial include Mexican wolf, ocelot, bald eagle, Sonora tiger salamander, Arizona shrew, black-tailed prairie dog, and jaguar. Although Coronado National Memorial has potential habitat for these species, they are not known to exist in the memorial at this time (NPS 2002d).

Jaguarundi have been reported in or near the Huachuca Mountains but never have been confirmed in Arizona. Potential habitat may exist in the memorial, but this area may be outside the range of the species. The Yaqui topminnow, cactus ferruginous pygmy-owl, and whooping crane are known to exist or have existed in Cochise County. However, the memorial has little or no potential habitat for these species, and they are not known to inhabit the memorial (NPS 2002d).

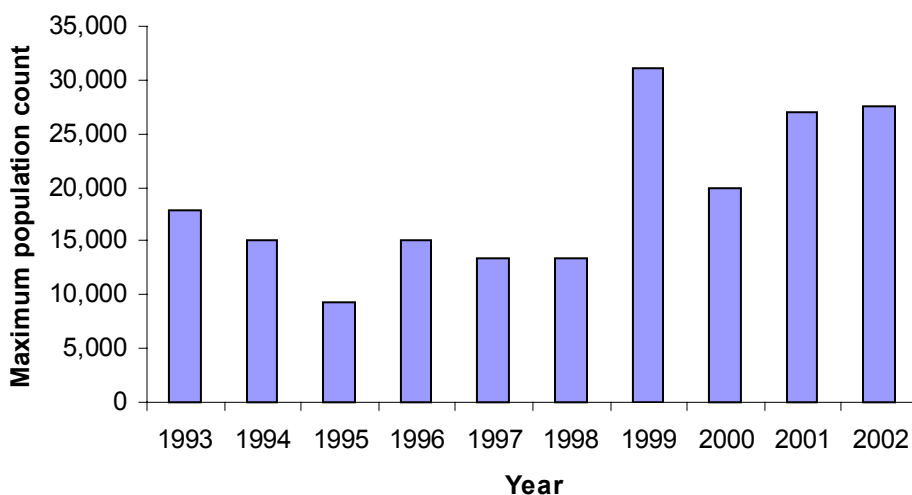
No sensitive plant species are known to exist in the memorial; therefore, this topic was dismissed from further consideration.

Lesser Long-nosed Bat. As described for Organ Pipe Cactus, the lesser long-nosed bat can be found in Arizona from April to September and in Mexico the rest of the year. The bats are in jeopardy because of disturbance to roost sites, killing by humans, and loss of food sources (agave and columnar cacti). In the daytime it roosts in caves and abandoned tunnels, which exist north and west of the proposed vehicle barrier. Lesser long-nosed bats establish maternity roosts from April through June in southwestern Arizona. At higher elevation sites, such as Coronado National Memorial, no sizable aggregations of lesser long-nosed bats occur until the latter part of July. The number of bats in the memorial peaks in mid to late August, and most are gone by late September. This residency period of 8 and 10 weeks corresponds with the blooming of Palmer's agave, a food source (Petryszyn

and Alberti n.d.). The bats forage throughout much of the memorial where flowering agaves are available (NPS 2003e).

Before it was designated a national memorial, the Coronado area was extensively mined. This activity produced numerous adits, shafts, and prospects. Most of these are potential roost sites for bats, as are caves. In 1993 a major roost with more than 18,000 bats was discovered approximately 2.4 miles from the proposed vehicle barrier site (NPS 2002d, 2003e). The bats occupy the site from the latter part of July to September or October (Petryszyn and Alberti n.d.). The population has averaged about 16,000 bats, fluctuating from a high of 31,000 in 1999 to a low of 9,000 in 1995 (NPS 2002d). This fluctuation is believed to be due to interchange with other nearby large roost sites on public and private lands over 15 miles from the memorial (NPS 2003e). Potential threats include loss of food plants due to habitat destruction caused by off-road driving, illegal foot trails, and construction projects (NPS 2003e).

Figure 16: Maximum Lesser Long-Nosed Bat Population Count



Mexican Spotted Owl. The Mexican spotted owl (federal threatened species and Arizona species of special concern) is threatened by habitat loss caused by logging and fires, increased predation associated with habitat fragmentation, and a lack of adequate protective regulations.

A pair of owls was first found in the memorial in 1997 in the park's northwest quadrant, and numerous sightings occurred in 1998 in a small canyon west of the nest site. The pair successfully fledged young in 1997 and 1999, using the same nest site both times. The memorial was in the process of establishing a protected activity center for this pair, but the owls could not be found after 2000 (B. Alberti, pers. comm., P. Steinholtz, URS, Jan. 2, 2003; NPS 2003f). No Mexican spotted owls have been sighted in the eastern half of the park, particularly along the southeastern border (B. Alberti, pers. comm., P. Steinholtz, URS, Feb. 5, 2003).

All of Coronado National Memorial is within the critical habitat for the owl (NPS 2002d). The Huachuca Mountains, in the northernmost area of the memorial, is included in one of six recovery units identified in the United States. This recovery unit is believed to be important habitat because of the high number of spotted owls relative to other recovery units (USFWS 1995a).

Mexican spotted owls commonly use Madrean pine oak forests (NPS 2003e). Their nesting and roosting sites generally consist of multilayered, uneven-aged forests with high canopy closure or rocky shaded canyons (USFWS 1995a). Mexican spotted owls forage primarily in mixed conifer forest on rocky slopes and pine-oak-juniper forests (Ganey and Balda 1994), which do not occur in the memorial's southeastern corner.

A 1996–97 survey of mammals in the memorial (Swann et al. 2000) mapped the presence of nocturnal rodents, including wood rats and peromyscid mice, the Mexican spotted owls' most likely prey base in this area. Prey species of the Mexican spotted owl do not inhabit the grasslands of the proposed vehicle barrier. Prey species are extremely common in the riparian areas of this allotment (7% of Montezuma allotment vegetation).

Mexican Long-tongued Bat. The Mexican long-nosed bat (federal species of concern, and state threatened) is being affected by the loss of food supplies, roosting habitat, and killing by humans.

The bat lives in the southwestern United States, typically in deep mountain canyons with dense riparian vegetation. During the day, this species roosts in caves, rock fissures, old mines, and occasionally buildings. This species has been captured in nets at water tanks at the memorial. It also has been observed at several mine adits in the area and at hummingbird feeders. Mexican long-tongued bats are never found in great numbers, and they may move from roost to roost on a nightly or weekly basis. They typically arrive at the memorial in late spring and remain into autumn (Petryszyn and Alberti n.d.).

Loggerhead Shrike. Loggerhead shrikes (federal species of concern) have been sighted in Coronado National Memorial, but they are relatively rare, with sightings in spring, summer and winter (Southwest Parks and Monuments Association 1993). As described for Organ Pipe Cactus National Monument, loggerhead shrike populations have declined drastically probably because of pesticides and loss of habitat, including wintering habitat, due to land development in coastal regions (NPS 2002d).

ENVIRONMENTAL CONSEQUENCES

Methodology and Intensity Thresholds

To determine impacts, all available information on known species was compiled. Predictions about short- and long-term impacts were based on existing data from Coronado National Memorial. The impact thresholds would be the same as for Organ Pipe Cactus and are repeated in the text box.

Impacts of Alternative A: The No-Action Alternative

Under this alternative, no action would be taken to prevent illegal vehicles from entering the memorial from Mexico.

Lesser Long-nosed Bat and Mexican Long-tongued Bat. No day roost habitat exists in the area of proposed impact that would support these bats, such as caves or abandoned mines. However, this area is rich in agave, which is a prime food source for the bats and could be damaged by illegal vehicular activity. Impacts from the destruction of habitat would be adverse, short- and long-term, and moderate.

Mexican Spotted Owl. While all of Coronado National Memorial has been designated as critical habitat for the Mexican spotted owl, this species primarily forages and nests in mixed conifer forests on rocky slopes and in pine/oak/juniper forests, which do not occur in the area of proposed action,

nor does the owl's most likely prey species inhabit the grasslands of the proposed area of impact. Therefore, impacts due to disturbance from construction activities would be adverse, short-term, and negligible.

Loggerhead Shrike. Loggerhead shrikes could be expected to inhabit the scattered trees and low scrub of the desert environment in the southeastern section of the memorial, although they are a rare visitor to Coronado. Illegal vehicles entering from the south could damage the shrike's habitat and induce flight response. Therefore, adverse, short- and long-term impacts would be minor.

Overall impacts to threatened or endangered species would be adverse, short and long term, and negligible to minor.

Cumulative Effects

The USBP proposed camera tower would have a beneficial, long-term, impact by providing increased protection, but it would not prevent vehicles from illegally entering the memorial. In addition, the tower could be placed within habitat for these listed species, resulting in possible long-term, adverse impacts.

Plans to replace the border road could also adversely impact vegetation and habitat. Continued driving along this road could also induce flight responses in the shrike; impacts would likely be greatest during construction.

Under the no-action alternative, impacts would be adverse, long term, and negligible to minor. When combined with reasonably foreseeable future actions, cumulative impacts would be adverse, long term, and minor.

Conclusion

Because no action would be taken to prevent illegal vehicular activity in the memorial, damage to important habitat could occur, resulting in adverse, short- and long-term, negligible to minor impacts. Cumulative impacts would be adverse, long term, and minor.

Because there would be no major, adverse impacts to threatened, endangered, or sensitive species, there would be no impairment of park resources or values.

Threatened, Endangered, and Sensitive Species Impact Thresholds

Negligible: An action 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 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 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 would have a noticeable change to a population or a large number of individuals of a species or resource. The change would be measurable and would 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 establishing 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 NPS planning documents.

Impacts of Alternative B: The Preferred Alternative

Lesser Long-nosed Bat and Mexican Long-tongued Bat. No day roost sites exist in the area of the proposed vehicle barrier, such as caves or abandoned mines. However, this area is rich in agave, which is a prime food source for the bats. The proposed project would result in the loss of 25 to 30 large agaves, and another 40 would be transplanted. Some plants beyond the 20-foot project construction area could also be impacted because roots could be damaged by construction. However, the impact area constitutes less than 1% of the available foraging habitat in the memorial, and at least half of the agaves in the construction area would be transplanted (NPS 2003e). Impacts from construction would be adverse, short term, and negligible. Beneficial, long-term, minor impacts would result because future damage to agave plants from illegal vehicular activity would be reduced or prevented, thus helping protect these species.

A detailed analysis of the expected effects of this project on threatened or endangered species is the subject of a separate biological assessment (NPS 2003e), which states that implementation of this project may affect, but is not likely to adversely affect, the lesser long-nosed bat or its habitat due to construction activities. This project may affect, and is likely to beneficially affect, this species due to eliminating or reducing illegal vehicular activity in the memorial.

Mexican Spotted Owl. While all of Coronado National Memorial is within critical habitat for the Mexican spotted owl, the habitats it primarily uses for foraging and nesting (mixed conifer forests on rocky slopes and in pine/oak/juniper forests) do not occur in the area of proposed action. Also, the owl's most likely prey species does not inhabit the grasslands of the proposed area of impact. Therefore, impacts due to disturbance from construction activities would be adverse, short term, and negligible. No long-term impacts from the presence of a vehicle barrier are expected because no owls are expected to use the project area.

A detailed analysis of the expected effects of this project on threatened or endangered species is the subject of a separate biological assessment (NPS 2003e), which states the proposed project would have no effect on the Mexican spotted owl. Critical habitat would be adversely modified, but the area of the proposed barrier contains no primary constituent elements of nesting and foraging habitat for this species.

Loggerhead Shrike. Loggerhead shrikes could inhabit the scattered trees and low scrub of the desert environment in the area of proposed impact, possibly preferring the posts and wires on the existing border fence. However, loggerhead shrikes are rare visitors to the memorial. Impacts would be adverse, short term, and minor due to construction activities. Beneficial, long-term, moderate impacts would occur because damage to shrike habitat from illegal vehicular activity would be reduced or prevented with a vehicle barrier, thus helping ensure further protection of this species. The rails used to create the barrier may also provide more lookout posts that the shrike prefers.

Overall impacts to threatened or endangered species would be adverse, short term, and negligible to minor due to construction activities; long-term impacts would be beneficial and minor due to increased protection.

Cumulative Effects

The proposed USBP camera tower would be outside the project area and would have a beneficial, long-term, minor impact by providing increased protection, particularly when used in conjunction with a vehicle barrier. However, the tower could be placed within habitat for these listed species.

Plans to upgrade the border road to all-weather standards could also adversely impact vegetation and habitat that is important to these species, depending on the extent of construction activities and revegetation efforts. Frequent driving along this road could also induce flight response in the shrike, possibly resulting in continued adverse, long-term, negligible impacts since this road is currently being used for patrol purposes. However, overall combined impacts would be beneficial, long term, and negligible.

Under the preferred alternative, impacts would be beneficial, long term, and minor. When combined with reasonably foreseeable future actions, cumulative impacts would be beneficial, long term, and moderate.

Conclusion

Overall impacts to threatened or endangered species would be adverse, short-term, and negligible to minor due to construction activities, as well as beneficial, long term, and minor due to increased protection. Cumulative impacts would be beneficial, long term, and minor.

Because there would be no major, adverse impacts to threatened, endangered, or sensitive species, there would be no impairment of park resources or values.

VISITOR USE, UNDERSTANDING, AND APPRECIATION

AFFECTED ENVIRONMENT

ACCESS AND VISITOR FACILITIES

Most visitors arrive at Coronado National Memorial by private vehicle by way of Arizona Highway 92. A substantial number of visitors are either year-round or seasonal residents of southern Arizona who make day trips. The memorial's increasing visitation reflects population growth in the region. Most visitors from outside the area come to the memorial as part of a larger regional itinerary.

VISITATION TRENDS

Recreational visits to Coronado National Memorial increased by 87% from 1981 to 2000 (from 47,825 to 89,523 visitors). Average yearly visitation over the past 10 years has been approximately 85,890; in 2002 there were 91,750 visitors. Visitation is highest in February, March, and April. Many school groups visit in May. The busiest week is usually between Christmas and New Year's Day. (NPS 2002d).

Most visitors travel to the higher elevation sites in the memorial, to the north and west. The lower grasslands are little used for recreation, although use is increasing because of greater visitor interest in exploring and hiking the memorial.

Visitation is expected to continue to increase due to growth in local population, urbanization, and the development of other local tourist attractions. Some visitors use national memorial facilities, including the road to Montezuma Pass or the Crest Trail, for access into Coronado National Forest, which is north and west of the memorial.

VISITOR EXPERIENCE

Visitors go to the visitor center, enjoy views from Montezuma Pass and Coronado Peak, and picnic, hike, and observe wildlife. About a third of the visitors come to the visitor center, and about 5.5% visit Coronado Cave (NPS 2002d). Visitors value Coronado's pristine, natural environment and solitude, so much so that they sometimes overlook the fact that the memorial was established for historical purposes (B. Alberti, pers. comm., P. Steinholtz, URS, Feb. 5, 2003).

Coronado National Memorial's location was chosen for the panoramic views of the U.S.-Mexico border and the San Pedro River Valley, the route believed to have been taken by Coronado. It was hoped that this proximity to the border would strengthen binational amity, as well as geographical and cultural bonds that link the two countries (NPS 2002d).

Five hiking trails in the memorial are located predominantly in the oak / Mexican piñon / juniper woodland association, away from the proposed vehicle barrier. The following trails provide views of much of the memorial.

- Joe's Canyon trail (3.1 miles) starts just west of the visitor center, passes through the saddle at the top of Smuggler's Ridge, and joins with the Coronado Peak trail to the Montezuma Pass parking area.

- Yaqui Ridge trail (1 mile) descends from Joe’s Canyon trail to international boundary marker 102 at the southwestern corner of the memorial. This trail is the southernmost point of the 790-mile Arizona Trail (described below).
- Crest Trail (2 miles within the memorial) extends 24 miles from the Montezuma Pass parking area to Fort Huachuca. It is a popular route to Miller Peak in Coronado National Forest.
- The 790-mile-long Arizona Trail starts in Coronado National Memorial extends from boundary marker 102 on the Mexican border to the Arizona-Utah state line. Parts of some other trails identified above have been incorporated into the Arizona Trail route.
- The scenic overlook at Montezuma Pass 3 miles west of the visitor center offers views of the San Raphael Valley to the west, the San Pedro River valley to the east (where Coronado may have entered what is now the United States), and Mexico to the south. Interpretive waysides along a 0.4-mile interpretive trail leading from the pass to Coronado Peak can provides information about the area’s physiography and historical significance. From Coronado Peak, visitors can view the San Pedro River valley to the east and San Rafael Valley to the west (NPS 2002d).

Coronado’s *Draft General Management Plan* includes plans to develop a loop trail in the grasslands south of the main road in the Montezuma Ranch area (NPS 2002d). This trail would be near the proposed project.

The natural features and panoramic views of the area remain similar to the actual time of the expedition and provide an excellent opportunity for contemplating the thoughts, motives, and hardships of members of the Coronado expedition and its impacts on native populations and the environment (NPS 2002d).

ENVIRONMENTAL CONSEQUENCES

METHODOLOGY AND INTENSITY THRESHOLDS

Past visitor use data, comment letters from the public, and personal staff observations 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 impact thresholds would be the same as those described for Organ Pipe Cactus and are repeated in the text box.

Visitor Experience Impact Thresholds

Negligible: The impact would be barely detectable and/or would affect few visitors.

Minor: The impact would be slight but detectable, and/or would affect some visitors.

Moderate: The impact would be readily apparent and/or would affect many visitors.

Major: The impact would be severely adverse or exceptionally beneficial and/or would affect the majority of visitors.

IMPACTS OF ALTERNATIVE A: THE NO-ACTION ALTERNATIVE

Under the no-action alternative vehicles could enter the memorial illegally from Mexico, potentially compromising the natural park setting and adversely affecting the experiences of visitors to the extent that the pristine environment was degraded. The no-action alternative would result in adverse, short- and long-term, minor impacts to visitor experiences.

The presence of abandoned vehicles in the memorial would potentially degrade viewscales, which played an important role in the selection of the memorial's location. Therefore, the no-action alternative would result in adverse, short- and long-term, negligible impacts to viewscales.

Cumulative Impacts

Reasonably foreseeable future actions include USBP plans to install a camera tower at Montezuma Ranch, 0.5 mile north of the border. Construction activities could result in adverse, short-term, negligible impacts to visitor experiences. The presence of the camera could also result in adverse, short- and long-term, negligible impacts to viewscales. Increased protection provided by the camera could enhance visitor experiences by protecting the memorial's pristine, natural environment, a beneficial, long-term, negligible impact.

The Border Patrol also plans to upgrade the existing border road within the 60-foot easement to an all-weather road. Construction activities would result in adverse, short-term, negligible impacts to visitors; no long-term adverse impacts are expected because a road already exists. Beneficial, long-term, negligible impacts would result from increased protection.

Under the no-action alternative, impacts would be adverse, long term, and minor. When combined with reasonably foreseeable future actions, cumulative impacts would be adverse, long term, and negligible.

Conclusion

Under the no-action alternative adverse, long-term, minor impacts would occur to visitors who expect a pristine, natural environment. The presence of abandoned vehicles and damage to natural resources as a result of illegal vehicle use would result in adverse, long-term, negligible impacts to viewscales. Cumulative impacts to visitor experience would be adverse, long term, and negligible.

IMPACTS OF ALTERNATIVE B: THE PREFERRED ALTERNATIVE

Under alternative B visitors would experience negligible short-term impacts from construction activities because of the isolated location of the proposed barrier. Because most visitors travel to the higher elevation sites to the north and west, they would not be affected by construction activities. In addition, the visitor center, Coronado Cave, and the park's hiking trails are far enough from the area of proposed action that visitors would not be affected.

Those visitors who wish to explore the memorial's lower grasslands would be more exposed to construction impacts. Overall, adverse, short-term, negligible impacts to visitors from construction activities would occur.

A vehicle barrier would reduce the potential for illegal vehicle traffic to damage natural resources in the future. Helping preserve the park's pristine natural setting would be a benefit to park visitors. Therefore, the presence of a vehicle barrier would result in beneficial, long-term, minor impacts to visitors who expect a pristine natural environment.

Because the location for Coronado National Memorial was chosen for the panoramic views of the border and the San Pedro River valley, scenic views are an important resource. The presence of the proposed vehicle barrier would not degrade viewscales because park staff believe that the presence of a vehicle barrier would be indistinguishable from the rest of the border road, which is very obvious from Montezuma Pass (B. Alberti, pers. comm., P. Steinholtz, URS, Feb. 5, 2003).

The barrier would be seen by visitors exploring the lower grasslands, particularly if the park developed the loop trail that is proposed in the *Draft General Management Plan*. However, because the barrier would only be 5 to 6 feet tall, and allowing it to rust, would reduce the degree to which it would intrude on the viewscape. The single horizontal rail would also help keep views unobstructed. Park staff have noted that many visitors are surprised that the international border is marked only by a simple barbed wire fence, and therefore, would not be adverse to seeing a barrier in this location (B. Alberti, pers. comm., P. Steinholtz, URS, Feb. 5, 2003).

Impacts to viewscales would be adverse, long-term, and negligible because the barrier would not be visible from most of the memorial.

Cumulative Effects

Future USBP plans in the area (see page 103) could result in adverse, short-term, negligible impacts due to construction activities. The presence of the camera tower could result in adverse impacts to viewscales; however, the camera's location 0.5 mile away from the barrier would not be obvious to most visitors. The camera could enhance the visitor experience by deterring illegal vehicle traffic and providing additional protection of the memorial's pristine, natural environment. Resulting impacts would be beneficial, long term, and minor.

Under the preferred alternative impacts would be beneficial, long term, and negligible to minor. When combined with reasonably foreseeable future actions, cumulative impacts would be beneficial, long term, and minor.

Conclusion

The presence of a vehicle barrier would result in beneficial, long-term, minor impacts to visitors who expect a pristine natural environment. Visitors would be exposed to adverse, short-term, negligible impacts during barrier construction. Impacts to viewscales would be adverse, long term, and negligible because the barrier would not be visible from most of the memorial. Cumulative impacts to visitor experience would be beneficial, long term, and minor.

HUMAN HEALTH AND SAFETY

AFFECTED ENVIRONMENT

Coronado National Memorial is in an area frequently used for smuggling undocumented aliens and illegal drugs. This creates a potential danger to visitors; however, they usually are unaware of these activities except for infrequent encounters with illegal aliens asking for rides. No recorded incidents involving visitors and illegal border activity have occurred in the past several years. However, one serious incident involving a visitor encountering smugglers occurred in 1997, when a hiker was assaulted at Montezuma Pass and her vehicle was stolen. In 1992, a kidnapping occurred by armed, suspected Mexican drug runners. The kidnapping was interdicted by a park ranger on routine patrol (T. Weigand, pers. comm., P. Steinholtz, URS, Jan. 29, 2003; NPS 2003f).

Rangers are regularly involved in special, multi-agency drug interdiction operations. For example, during the first two weeks of February 2003, they seized over 4,200 pounds of marijuana and three vehicles. On February 8, a drive-through took place in Montezuma Wash. Surveillance of the area began the day before when rangers saw two vehicles south of the border and two people tampering with the fence. They left the area when a scout preceding them spotted the observing ranger. Rangers and officers monitored radio traffic and determined that a drive-through was going to occur on the morning of February 8. The vehicles crossed the boundary, but turned south after contacting officers (which consisted of park rangers, Customs, and Border Patrol rangers). One vehicle was stopped and one passenger was apprehended. The driver of that vehicle and those in a second vehicle escaped. A third vehicle was thought to be involved, but was never seen. The arrested passenger said that the third vehicle was an SUV or van containing 8 to 10 people, all armed with AK-47s, AR-15s, and MAC-90s. They were to shoot suppressing fire at any officer chasing a vehicle back toward Mexico (NPS 2003d).

Park staff were involved in over 60 incidents that dealt with drugs or undocumented aliens in 2002 (T. Weigand, pers. comm., P. Steinholtz, URS, Jan. 29, 2003). Table 13 shows the number of illegal border-related incidents that have occurred at the memorial between 2000 and 2002. The table only shows incidents that park staff were involved with and are aware of.

Table 13: 2000–2002 Border-Related Incidents at Coronado National Memorial

Incident	2000–2002
Stolen vehicles driven through park	0
Failure to yield	9
Narcotics	36
Undocumented aliens*	97
Abandoned vehicles	5
Incursions	1
Off-road driving	9
Miscellaneous	0
Arrests	2,387
Murder	0
Total	2,544

* Each incident could involve multiple undocumented aliens.

ENVIRONMENTAL CONSEQUENCES

METHODOLOGY AND INTENSITY THRESHOLDS

Park staff at Coronado National Memorial were consulted to estimate the effects of the actions in the alternatives. Any past major incident or an incident that resulted in personal injury or property was recorded and investigated. The impact thresholds would be the same as for Organ Pipe Cactus and are repeated in the text box.

IMPACTS OF ALTERNATIVE A: THE NO-ACTION ALTERNATIVE

Under this alternative the park would take no action to prevent vehicles from illegally entering the memorial. As long as smuggling continued to be a viable business, park staff and visitors would continue to be at risk. Therefore, impacts to human health and safety would be adverse, short and long term, and minor to moderate.

Human Health and Safety Impact Thresholds

Negligible: Public health and safety would not be affected, or the effects would be at low levels of detection and would not have an appreciable effect on public health or safety.

Minor: The effect would be detectable and would likely be short-term, but would not have an appreciable effect on public health or safety. If mitigation was needed, it would be relatively simple and would likely be successful.

Moderate: The effects would be readily apparent and long term, and they would result in substantial, noticeable effects to public health and safety on a local to regional scale. Mitigating measures would probably be necessary and would likely be successful.

Major: The effects would be readily apparent and long term, and they would result in substantial, noticeable effects to public health and safety on a regional to national scale. Extensive mitigation measures would be needed, and their success would not be guaranteed.

Cumulative Impacts

Future USBP plans in the area (see page 103) could result in adverse, short-term, negligible impacts due to construction activities. Impacts due to increased protection of resources and visitors would result in beneficial, long-term, and negligible impacts because of expected increases in illegal activity.

Under the no-action alternative, impacts would be adverse, long term, and minor to moderate. When combined with other reasonably foreseeable future actions, cumulative impacts would be adverse, long term, and negligible, because no direct measures would be taken to protect human health and safety.

Conclusion

Under this alternative impacts to human health and safety would be adverse, long term, and minor to moderate because no additional measures would be taken to prevent illegal vehicular activity in the memorial. Cumulative impacts would be adverse, long term, and negligible.

IMPACTS OF ALTERNATIVE B: THE PREFERRED ALTERNATIVE

Although most visitors to the memorial have not been routinely exposed to criminal activity related to drug smuggling, the potential exists for such incidents to occur, as long as smuggling remains a viable economic pursuit. Park staff are particularly likely to be involved in violent encounters, particularly since smugglers have become more heavily armed. Despite the presence of a vehicle barrier, visitors and employees could still come into contact with smugglers who travel on foot. The presence of a vehicle barrier in the park's most accessible terrain would result in beneficial, long-term, minor impacts to the health and safety of memorial visitors and staff.

Cumulative Effects

Future USBP plans in the area (see page 103) could result in increased protection of resources. Combined with a vehicle barrier, the camera tower would provide increased protection to human health and safety in the only area of the memorial that is accessible by illegal vehicles, resulting in beneficial, long-term, minor impacts.

The Border Patrol currently patrols the international boundary within the memorial, where it has responsibility for the detection and prevention of smuggling and illegal entry of undocumented aliens into the United States. NPS rangers work with the Border Patrol to protect resources and apprehend illegal aliens and drug smugglers. Both agencies would benefit from the additional protection provided by a vehicle barrier, perhaps allowing them to concentrate enforcement efforts on other illegal activities, resulting in beneficial, long-term, moderate impacts to visitor and park staff health and safety.

Under this alternative, impacts would be beneficial, long term, and minor. When combined with reasonably foreseeable future actions, cumulative impacts would be beneficial, long term, and moderate.

Conclusion

The presence of a vehicle barrier would result in beneficial, long-term, minor impacts to the health and safety of memorial visitors and staff by reducing the amount of illegal vehicular activity in the memorial. Cumulative impacts would be beneficial, long term, and moderate.

PARK MANAGEMENT AND OPERATIONS

AFFECTED ENVIRONMENT

Currently 11 full-time staff and 2 part-time staff are employed at Coronado National Memorial. Of these 12 employees, 5 are law enforcement staff. Maintenance crews from Organ Pipe Cactus National Monument would also be responsible for maintaining the memorial's vehicle barrier.

ENVIRONMENTAL CONSEQUENCES

METHODOLOGY AND INTENSITY THRESHOLDS

For the purpose of this analysis, park operations refers 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, and (2) the ability of park staff to protect and preserve resources given current funding and staffing levels. The impact analysis was based on park staff knowledge and current park operations. Definitions for impact thresholds would be the same as for Organ Pipe Cactus and are repeated in the text box.

IMPACTS OF ALTERNATIVE A: THE NO-ACTION ALTERNATIVE

Under this alternative park staff would continue current actions to prevent vehicles from illegally entering the memorial; however, these actions are of limited success due to current staffing levels (NPS 2003f). Therefore, impacts would continue, resulting in adverse, short- and long-term, moderate impacts.

Cumulative Impacts

Future USBP plans in the area (see page 103) could result in increased protection of resources, which would benefit park management and operations by deterring illegal entry into the memorial. Impacts would be adverse, long term, and minor because no direct action would be taken to improve park management and operations.

Under the no-action alternative impacts would be adverse, long term, and moderate. When combined with other reasonably foreseeable future actions, cumulative impacts would be adverse, long term, and minor.

Impact Thresholds for Park Management and Operations

Negligible: Park operations would not be affected or the effect would be at or below the lower levels of detection.

Minor: The effect would be detectable, but would be of a magnitude that it 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 effect 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 effect 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 would 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.

Conclusion

Current staffing levels are insufficient to adequately address issues related to illegal smuggling. Therefore, impacts would continue to be adverse, long term, and moderate. Cumulative impacts would be adverse, long term, and minor.

IMPACTS OF ALTERNATIVE B: THE PREFERRED ALTERNATIVE

The presence of a vehicle barrier would help prevent illegal vehicular use in the national memorial, resulting in beneficial, short- and long-term, minor impacts. However, as drug smugglers devised alternative methods to illegally enter the monument, law enforcement rangers would need to increase efforts to confront such activity.

Increases in illegal activity would require proportionate increases in law enforcement. While the presence of the vehicle barrier would help protect park resources, visitors, and personnel, the number of rangers required to prevent illegal drug activities would probably continue to increase to keep pace with rising criminal activity.

No additional maintenance equipment or increases to maintenance staff would be required, because vehicle barrier maintenance would be conducted by crews from Organ Pipe Cactus National Monument.

Cumulative Effects

Future USBP plans in the area (see page 103) could result in increased protection of resources, which would reduce demands on park management and operations, particularly when combined with a vehicle barrier. These beneficial impacts would be long term and minor.

As described for alternative A, both the U.S. Border Patrol and the National Park Service would benefit from the additional protection provided by a vehicle barrier, perhaps allowing staff resources to be focused on other illegal activities. This would result in beneficial, long-term, moderate impacts to park management and operations.

Under the preferred alternative, impacts would be beneficial, long term, and minor. When combined with reasonably foreseeable future actions, cumulative impacts would be beneficial, long term, and moderate.

Conclusion

The presence of a vehicle barrier would result in beneficial, long-term, minor impacts to park management and operations. No additional maintenance equipment or increases to maintenance staff would be required. Cumulative impacts would be beneficial, long term, and moderate.

CONSULTATION AND COORDINATION

AGENCIES/TRIBES/ORGANIZATIONS/INDIVIDUALS CONTACTED

Ak-Chin Him Dak
Ak-Chin Indian Community
Arizona Game and Fish
Arizona State Historic Preservation Office
Bureau of Land Management
Gila River Indian Community
Hopi Tribe
JTF-6
Salt River Pima-Maricopa Indian Community
Tohono O'odham Nation
U.S. Border Patrol
U.S. Fish and Wildlife Service

PREPARERS

National Park Service

Laurie Domler, NEPA/106 Specialist, Intermountain Region Support Office

URS Corporation

James Denier, Senior Consultant and Leader, Environmental Assessment Team. B. A., Biology; M. B. A., Business Management. Responsible for overall project coordination. Experience: Over 22 years in environmental planning, assessment, and compliance.

James Doenges, Senior Scientist, M.S., Biology and B.S., Biology. Responsible for ecological analysis. Experience: Over 20 years experience in environmental impact assessment and natural resource management.

Greg Sorensen, Technical Writer/Editor. B. A., International Affairs. Responsible for editing document. Experience: 28 years.

Patti Steinholtz, NEPA Planner, Editor/Graphic Illustrator. B. A., Communications and English. Responsible for research, coordination, and preparation of document; also responsible for editing text and preparing maps. Experience: 2 years with NEPA documentation; 10 years as graphic artist; 6 years as writer.

Nancy VanDyke, Senior Consultant and Leader, Regulatory Team. B. A., Biology and Geography; M.S., Environmental Sciences. Responsible for technical review of document, water quality methodology. Experience: Over 22 years in environmental planning, assessment, compliance.

CONTRIBUTORS

NATIONAL PARK SERVICE

Coronado National Memorial

Dale Thompson, Superintendent
Alberti, Barbara. Integrated Resources Program Manager

Weigand, Thane. Chief Ranger

Organ Pipe Cactus National Monument

Bill Wellman, Superintendent

Mikus, William. Facility Manager

Rowlands, Peter. Supervisory Resource Management Specialist

Rutland, Susan. Biologist

Stinson, Robert. Acting Chief Ranger

Tibbitts, Tim. Wildlife Biologist

Western Archeological and Conservation Center

A. Trinkle Jones, Acting Chief, Division of Archeology

Chris Corey, Archeologist

AGENCIES, ORGANIZATIONS, AND BUSINESSES NOTIFIED ABOUT THE DOCUMENT

FEDERAL AGENCIES

Advisory Council on Historic Preservation

Bureau of Indian Affairs

Bureau of Land Management

Cabeza Prieta National Wildlife Refuge

Department of Interior

Department of Justice

Federal Communications Commission

International Boundary and Water Commission

Marine Corps Air Station

National Biological Survey

National Park Service

State Department, United States/Mexico

Border Affairs

U.S. Air Force

U.S. Border Patrol

U.S. Customs Service

U.S. Department of Agriculture

U.S. Drug Enforcement Agency

U.S. Environmental Protection Agency

U.S. Fish and Wildlife Service

U.S. Forest Service

U.S. Geological Survey

INDIAN TRIBES

Ak-Chin Indian Community

Fort McDowell Mohave-Apache Indian

Community

Fort Sill Apache Tribe of Oklahoma

Hia-Ced O'odham

Hopi

Mescalero Apache Tribe

O'odham of Mexico

Pascua Yaqui Tribe of Arizona

Pueblo of Zuni

Salt River Pima-Maricopa Indian Community

San Carlos Apache

Tohono O'odham Nation

Tonto Apache

White Mountain Apache

Yavapi-Apache

STATE AND LOCAL AGENCIES

Arizona Department of Agriculture

Arizona Department of Environmental Quality

Arizona Department of Tourism

Arizona Department of Transportation

Arizona Ecological Services

Arizona Game and Fish Department

Arizona State Clearinghouse

Arizona State Historic Preservation Office

Arizona State Parks

Department of Disease Control

BUSINESSES, ORGANIZATIONS, AND UNIVERSITIES

Ajo Auto Wrecking

Ajo Copper News

Ajo District Chamber of Commerce

Alto Golfo Biosphere Reserve

Argonne National Laboratory

Arizona Cattle Growers Association

Arizona Daily Star	INE SEMARNAP
Arizona Department of Environmental Quality	Institute for Sustainable Development
Arizona Historical Society	Intercultural Center for the Study of Deserts and Oceans
Arizona Nature Conservancy	International Sonoran Desert Alliance
Arizona People for the USA	K101-FM
Arizona Public Service Company	Kaibab Forest Products Company
Arizona Republic	KDAP
Arizona State Museum	KHIL
Arizona Trails Association	KKYZ
Arizona Wildlife Federation	KNXN-AM
Arizona/Mexico Commission	La Leche League
Arizona-Mexico Border Health Foundation	Man and the Biosphere Program
Arizona-Sonora Desert Museum	Mediation and Public Management, Inc.
Audubon Society, Tucson Chapter	National Parks and Conservation Association
Benson Chamber of Commerce	Natural Resource Conservation Service
Bisbee Chamber of Commerce	New Mexico Highlands University
Bisbee News/Bisbee Now	Northern Arizona University
Border Research Institute	Northwestern University
Bowling Green State University	Pearce-Sunsites Chamber of Commerce
Capital Media Services	Phillips Publishing, Inc.
Center for Biological Diversity	Pima Association of Governments
Cholla Bay Sportsmans Club	Pima County Parks and Recreation
Cochise County Board of Supervisors	Pima Trails Association
Cochise County Planning and Zoning Department	PRONATURA
Cochise Sunday	Radiation Measurements Facility
College of Agricultural and Home Economics	Ramsey Canyon Preserve
Colorado State University	Rocky Point Research Group
Commission on Arizona Environment	Rocky Point Times
Copper Queen Library	Round River Conservation Studies
Creative Expression	San Pedro NCR
D2 Chriopterology	San Pedro Valley News
Dames & Moore	Secretaria de Fomento Alturismo
Defenders of Wildlife	Servi-Services
Douglas Chamber of Commerce	Sierra Club, Tucson Chapter
Douglas Daily Dispatch	Sierra Vista Chamber of Commerce
Drylands Institute	Sierra Vista Convention and Visitors Bureau
Ecological Consulting and Research	Sierra Vista Garden Club
Elderly Program	Sierra Vista Herald/Bisbee Daily Review
Five Star Weekly/Mountain View News	Sierra Vista Public Library
Fort Huachuca Library	Sierra Vista Public Schools
Friends of the Huachuca Mountains	Sky Island Alliance
Friends of the San Pedro River	Sonoran Arthropod Studies Institute
Gilbert Tribune	Sonoran Institute
Green Valley News and Sun	Southeastern Arizona Bird Observatory
Health Department/MCH	Southeastern Arizona Government Organization
Hereford Natural Resources Conservation District	Southeastern Bird Observatory
Huachuca Audubon Society	Southern Arizona Trails Resource Guide
Huachuca Hiking Club	Southwest Center for Biological Diversity
IMADES, Reyes y Aguascalientes esq.	Southwest Parks and Monuments Association

TCI of Southern Arizona
The Arizona Daily Star
The Arizona Range News
The Arizona Republic
The Bisbee Observer
The Economic and Environment Association
The Institute of Cultural Affairs
The Nature Conservancy
The Runner
The Sonoran Institute
The Sunsiter
The Tucson Weekly
The Wilderness Society
The Wildlands Project
The Wildlife Society
Thunder Mountain Trekkers
Tombstone Chamber of Commerce
Tombstone Tumbleweed
Tribune Newspapers

Tucson Audubon Society
Tucson Citizen
Tucson Public Library, Ajo Branch
University of Arizona
University of California
University of Canberra
URS Corporation
USGS-Sonoran Desert Field Station
Western Archeological and Conservation
Center
Western Arizona HEC
Willcox Chamber of Commerce and
Agriculture
Yuma County Chamber of Commerce

INDIVIDUALS

A complete list is on file with the National Park
Service Intermountain Region, Denver.

APPENDIX A: CORRESPONDENCE



United States Department of the Interior

NATIONAL PARK SERVICE
ORGAN PIPE CACTUS NATIONAL MONUMENT

10 Organ Pipe Drive
Ajo, Arizona 85321



January 29, 2003

Ronald Ventura, Chairman
Babaquivari District
P.O. Box 3015
Sells, Arizona 85634

Dear Chairman Ventura:

Because of recent incidents along the international border, including the murder of our Ranger, Kris Eggle, the National Park Service is preparing to take measures to provide better protection for our staff, visitors and park resources at Organ Pipe Cactus National Monument. These measures include increasing our ranger staff and installing a vehicle barrier along the border with Mexico.

We realize that the illegal activity and resource damage is not limited to Organ Pipe Cactus National Monument. We would like to invite representatives of the Gu Vu District to meet with us and Cabeza Prieta National Wildlife Refuge, our neighbor to the west, to discuss strategies to extend protection of the border beyond Organ Pipe Cactus NM. In addition, we would like to discuss the impact of our vehicle barrier on cultural resource of significance to you.

We would like to meet on Friday, February 7 at 10:00am at the monument headquarters.

10:00 am to Noon	Discussion of border security
Noon	Lunch (provided by the monument)
1:00 pm to 3:00 pm	Visit cultural sites in project area

We look forward to discussing our common concerns with you.

Sincerely,

William E. Wellman
Superintendent



United States Department of the Interior

NATIONAL PARK SERVICE ORGAN PIPE CACTUS NATIONAL MONUMENT

10 Organ Pipe Drive
Ajo, Arizona 85321



January 22, 2003

Wayne Taylor Jr., Chairman
The Hopi Tribe
P.O. Box 123
Kykotsmovi, Arizona 86039

Dear Chairman Taylor:

The National Park Service at Organ Pipe Cactus National Monument in Southwestern Arizona proposes to construct a vehicle barrier along approximately thirty miles of the International Border, which is also the southern boundary of the National Monument. The Intermountain Regional Office is in the process of preparing an Environmental Assessment (EA) for the proposed vehicle barrier project. Preparation of the EA is necessary to meet the requirements of the National Environmental Policy Act.

National Park Service archeologists recently completed a survey of the entire International Border within the National Monument to meet our National Historical Preservation Act (NHPA) responsibilities. Seven archeological sites were identified within the survey corridor: Dos Lomitas Ranch, also referred to as Blankenship Well (SON C:1:36, 37, 39, 40-43), Gachado Well and Line Camp, Quitobaquito Well (SON B:4:16-24), three prehistoric sites (ORPI 2002D-1, ORPI 2002D-2, SON C:1:39), and an historic corral (ORPI 2002D-3). These sites were assessed in relation to the proposed construction activities. The proposed project will have an effect on these cultural resources.

I am writing to solicit your comments regarding cultural resources located along the International Border that are of significance to the Tohono O'odham, Hia C'ed O'odham, and possibly other tribes. The National Park Service is committed to eliciting comments from American Indian tribes that may have interests in or concerns about undertakings within Organ Pipe Cactus National Monument. Please forward comments by February 7, 2003 to:

Bill Wellman, Superintendent
Organ Pipe Cactus National Monument
10 Organ Pipe Drive
Ajo, Arizona 85321

As planning proceeds, you will be sent project updates, including the environmental assessment. We may also wish to conduct a site visit to consider strategies for extending the barrier beyond the monument boundaries. Questions about the project or the environmental assessment can be directed to Bill Wellman at (520) 387-5840, or Laurie Domler, NEPA/106 Specialist at the Intermountain Regional Office at (303) 969-2036.

Sincerely,

William E. Wellman
Superintendent

Cc:
Trinkle Jones, WACC

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

