

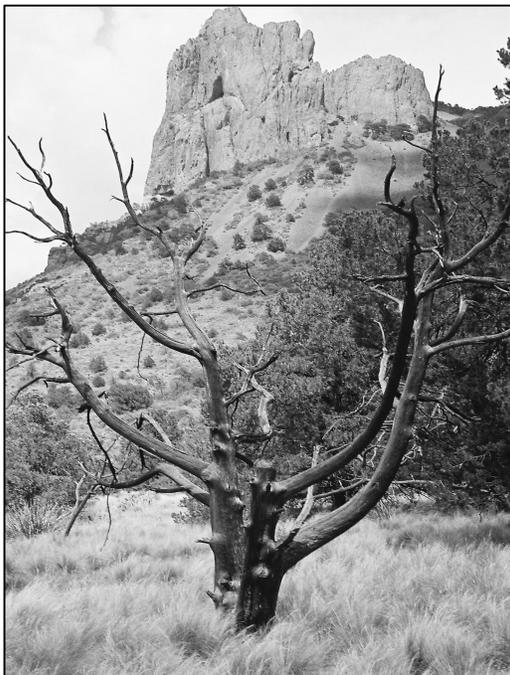
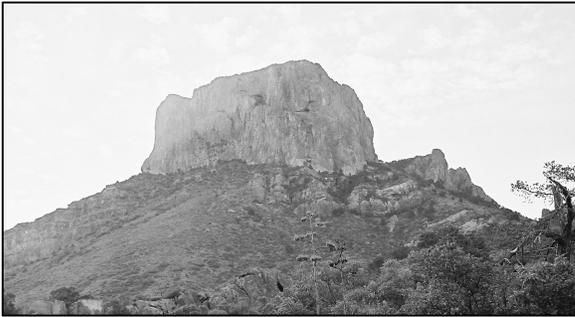


National Park Service
U.S. Department of the Interior
Big Bend National Park
Big Bend, Texas

Big Bend National Park

Construct New Housing and Operations Facilities Draft Environmental Assessment

August 2008



ENVIRONMENTAL ASSESSMENT

Construct New Housing and Operations Facilities

Summary

The National Park Service (NPS) at Big Bend National Park is proposing to construct new housing and other facilities at Panther Junction, Castolon and Rio Grande Village, all within Big Bend National Park. The construction at Panther Junction would include: a new duplex; new storage building; expansion of the gas station/ convenient store; new NPS, U.S. Border Patrol and concession housing units; a new NPS, U.S. Border Patrol and Concession law enforcement complex; a new NPS and Border Patrol law enforcement complex, and; new recreational facilities. The new construction at the Rio Grande Village location would include two new U.S. Border Patrol houses, a new NPS law enforcement ranger house, a concession duplex, and expansion of the NPS seasonal RV pad area with three new hookup sites. The new facilities at the Castolon location would include two new U.S. Border Patrol houses and a new NPS law enforcement ranger house.

The proposed project is needed to provide a safe, healthy, functional, and efficient working environment for the Big Bend National Park staff, concessionaires, and U.S. Border Patrol. The project is needed to replace substandard housing currently being used by Big Bend National Park staff and by the concessionaire. Additional housing and associated facilities are needed to accommodate existing and additional Park and concessionaire staff. Additionally, the U.S. Border Patrol is proposing to expand their staff located at Big Bend National Park. Additional housing and facilities are needed to accommodate these needs as well.

This Environmental Assessment (EA) evaluates two alternatives – A “No Action Alternative” and the “Proposed Action,” which is the NPS “Preferred Alternative.” The No Action Alternative describes the current conditions of the existing facilities and the impacts that may occur if there was no construction proposed. The Proposed Action describes construction of new facilities to meet the needs of the NPS staff, concessionaires, and the U.S. Border Patrol. This document analyzes the potential environmental effects of this construction.

This EA has been prepared in compliance with the National Environmental Policy Act (NEPA) to provide the decision-making framework that: 1) analyzes a reasonable range of alternatives to meet objectives of the proposal, 2) evaluates potential issues and impacts to Big Bend National Park’s resources and values, and 3) identifies mitigation measures to lessen the degree or extent of adverse impacts. Resource topics analyzed in this document include soils, cultural resources, lightscape management, park operations and special status species. These topics were chosen by the interdisciplinary team because one or both of the alternatives has the potential to have greater than minor impacts on these resources. Several other resource topics were considered but dismissed from further analysis because neither alternative has the potential to have measurable impacts to these resources. The Proposed Action is not anticipated to have any major impacts on park resources or values. Public scoping was conducted to facilitate the development of this document, and comments were received from two government agencies and two Native American tribal representatives. Comments are addressed in the appropriate sections of the following environmental analysis.

Public Comment

If you wish to comment on this EA, you may post comments online at www.parkplanning.nps.gov/bibe or mail comments to: Superintendent; Big Bend National Park; P.O. Box 129; Big Bend National Park, Texas 79834.

This Draft EA will be on public review for 30 days. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

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ABBREVIATIONS AND ACRONYMS

APE	Area of Potential Effect
BMPs	Best Management Practices
CEQ	Council on Environmental Quality
CO	Carbon Monoxide
CFR	Code of Federal Regulations
DO	NPS Director's Order
EA	Environmental Assessment
EPA	U.S. Environmental Protection Agency
GMP	General Management Plan
MOA	Memorandum of Agreement
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NO ₂	Nitrogen Dioxide
NPS	National Park Service
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
O ₃	Ozone
Pb	Lead
PEPC	Planning, Environment and Public Comment
PM ₁₀	Particulate Matter (Course)
PM _{2.5}	Particulate Matter (Fine)
SHPO	Texas State Historic Preservation Office
SO ₂	Sulfur Dioxide
TCEQ	Texas Commission on Environmental Quality

PURPOSE AND NEED

Purpose

Big Bend National Park encompasses more than 801,000 acres in south Brewster County in southwest Texas (Figure 1). The Park was established on June 20, 1935, by an act of Congress “for recreational park purposes...[and]...for the benefit and enjoyment of the people.” Big Bend National Park’s purpose is threefold (NPS 2004):

- Preserve and protect all natural and NRHP-eligible cultural resources and values.
- Provide educational opportunities to foster understanding and appreciation of the natural and human history of the region.
- Provide recreational opportunities for diverse groups that are compatible with the protection and appreciation of park.

The Park is significant because it contains the most representative example of the Chihuahuan Desert ecosystem in the United States. The Park’s river, desert, and mountain environments support an extraordinary richness of biological diversity, including endemic plants and animals, and provide unparalleled recreation opportunities. The geologic features and Cretaceous and Tertiary fossils in Big Bend National Park furnish opportunities to study the sedimentary and igneous processes.

Archeological and historic resources provide examples of cultural interaction in the Big Bend Region and varied ways humans adapted to the desert and river environments. The Park has national significance as the largest protected area of Chihuahuan Desert topography and ecology in the United States (NPS 2004) and has international significance as a designated biosphere reserve (UNESCO 1976).

This Environmental Assessment (EA) has been prepared to examine the environmental impacts associated with the proposal to construct new housing and other facilities within the Park. The new construction would occur at Panther Junction, Rio Grande Village, and Castolon (Figure 1). Specifically, the construction would include:

Panther Junction Location

- Duplex for Big Bend Natural History Association staff (one, new)
- Storage Building for Science and Resource Management staff and equipment (new)
- Gas Station/ Convenience Store expansion (laundry facilities, showers and parking)
- U.S. Border Patrol Housing (two, as replacement for existing trailers)
- U.S. Border Patrol Housing (two, new)
- Law Enforcement Complex, including
 - U.S. Border Patrol Offices
 - NPS Law Enforcement Offices
 - Ranger Staff Offices
 - Detention Center
 - Bus/Boat Bays
 - River Operations and Search/Rescue Caches
 - Driveway, parking lot and utilities

- Housing Complex, including
 - Concession Housing (up to 3 dorms)
 - NPS Staff Housing (seasonal)
 - Fire Dorm
 - Recreational Facility
 - Tennis Court

Rio Grande Village Location

- U.S. Border Patrol Housing (two, new)
- Expand NPS Staff Seasonal RV Pad area by adding 3 hookup sites
- Concession Duplex
- Law Enforcement Ranger Housing (one, new)

Castolon Location

- U.S. Border Patrol Housing (two, new)
- Law Enforcement Ranger Housing (one, new)

The purpose of the proposed new construction is to provide a safe, healthy, functional, and efficient working environment for the Big Bend National Park staff, concessionaires, U.S. Border Patrol, and Big Bend Natural History Association staff. The new construction will also comply with the current *Big Bend National Park General Management Plan* (GMP) (NPS 2004) and applicable NPS policies. This EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality (CEQ) regulations (40 CFR 1500 et seq), and NPS Director's Order 12: *Conservation Planning, Environmental Impact Analysis, and Decision-making* (DO-12).

Need

The Proposed Action is needed to replace substandard housing currently being used by Big Bend National Park staff and by the concessionaire. Additional housing and associated facilities are needed to accommodate existing and additional Park and concessionaire staff. Additionally, the U.S. Border Patrol is proposing to expand their staff located at Big Bend National Park. Additional housing and related facilities are needed to accommodate these needs as well.

The NPS currently has 92 permanent staff and 41 seasonal staff at Big Bend National Park. Additionally, the concessionaire (Forever Resorts) has 60 permanent staff and 25 seasonal staff (NPS 2007). According to the Park's GMP, overcrowding has extended to the administrative and operations of the Panther Junction headquarters facility. Since the facility was constructed, the park staff has grown, increasing both office and storage needs. The Park does not have adequate housing for its employees. The problem is compounded by the limited amount of land that is suitable for housing development within the park. The remoteness of the area makes commutes from the gateway communities prohibitively long (NPS 2004). The need for the recreational facility and tennis court is to provide park staff and residences with basic recreational and exercise facilities, and provide an alternative to the single multi-purpose outdoor court that is in poor condition.

Scoping

Scoping is a process intended to identify the resources that may be affected by a Proposed Action, and explore possible alternative ways of achieving the objectives of a Proposed Action while minimizing

adverse impacts. The project team conducted both internal scoping with appropriate NPS staff and external scoping with the public and other agencies.

Internal scoping was conducted with an interdisciplinary team of environmental professionals from Big Bend National Park. Project information needed to begin internal scoping was entered into the NPS "Planning, Environment and Public Comment" (PEPC) online system in June 2007. Interdisciplinary team members were provided details of the Proposed Action at the project kickoff meeting and through the completion of an Environmental Screening Form, recorded in PEPC in September 2007. Additionally, interdisciplinary team members discussed the purpose and need for the project; various alternatives; potential environmental impacts; present, and reasonably foreseeable projects that may have cumulative effects.

External scoping was initiated with the distribution of a scoping letter to inform the public of the proposed new construction, and to generate input relevant to the preparation of this EA. The scoping letter, dated June 14, 2007, was mailed to 80 interested parties including local, state, and federal agencies; special interest groups; academic institutions; businesses; and individuals. In addition, the scoping letter was mailed to the Park's seven affiliated Native American tribes. Scoping information was also posted on Park's website.

During the 30-day scoping period, four responses were received. Two were from Native American tribal representatives, one was from the Brewster County Judge and the other was from the Texas Commission on Environmental Quality (TCEQ). The Native American tribal representatives indicated no concern for the proposed project. The Brewster County Judge indicated support for the proposed project. The TCEQ recommended protection of surface and groundwater resources. Copies of the comment letters are included in Appendix B.

Appropriate Use

Management Policies 2006 direct that the National Park Service must ensure that park uses that are allowed would not cause impairment of, or unacceptable impacts on, park resources and values. A new form of park use may be allowed within a park only after a determination has been made in the professional judgment of the park manager that it will not result in unacceptable impacts.

Evaluation factors for determining appropriate uses are:

- Consistency with applicable laws, executive orders, regulations, and policies;
- Consistency with existing plans for public use and resource management;
- Actual and potential effects on park resources and values;
- Total costs to the service; and
- Whether the public interest will be served.

Park managers must continually monitor all park uses to prevent unanticipated and unacceptable impacts. If unanticipated and unacceptable impacts emerge, the park manager must engage in a thoughtful, deliberate process to further manage or constrain the use, or discontinue it. More information on the definition of unacceptable impacts can be found in the Environmental Consequences chapter.

The proposed new construction is consistent with the Park's GMP and other related park plans. With this in mind, the NPS finds that construction and use of the proposed new facilities is an acceptable use at Big Bend National Park.

Relationship to Other Plans and Policies

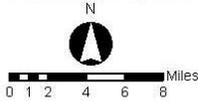
Plans and policies relevant to the Proposed Action include the Big Bend National Park GMP and *Management Policies 2006* (NPS 2006b). The Proposed Action would meet the goals and objectives of these plans and policies in the following ways:

- The Park's enabling legislation states that the Park was set aside "for recreational park purposes...[and]...for the benefit and enjoyment of the people." The Proposed Action would meet the objectives of the Park's enabling legislation by improving operations and management of the Park through the improvement of staff conditions.
- The central objective of the Big Bend National Park GMP is to enhance visitor experience while protecting Park resources. The Park's GMP outlines new construction for housing and operations facilities. The Proposed Action would meet these objectives of the GMP by implementing this new construction.
- *Management Policies 2006* state that "the protection of each park's resources and values will be the primary consideration in facility development decisions. Facilities for visitor use and park management will be consistent with each park's authorizing legislation, and with approved GMPs, development concept plans, and associated planning documents. The planning and design of park facilities will be accomplished by interdisciplinary teams constituted to meet the resource stewardship, programmatic, and technical requirements of the project." The proposed new construction has been developed to meet these objectives.

Figure 1 – Project Location Map



Source: ArcGIS_Server, NAIP 2004 Imagery



- Park Boundary
- Rio Grande River
- Dirt Road
- Paved Road
- Trail



Location Map
Big Bend National Park

Impacts Topics Retained for Further Analysis

Impact topics analyzed for the No Action Alternative and the Proposed Action have been identified on the basis of federal laws and regulations, NPS Director's Orders, *Management Policies 2006*, and staff knowledge of resources at Big Bend National Park. A brief overview of impact topics retained for further analysis in this EA are listed below along with the reasons why the impact topic is further analyzed. Detailed analysis of each of these topics, including the regulatory context and the existing baseline conditions (affected environment) for each of these topics is provided in the Environmental Consequences section of this document.

Soils

Soils in the Park occur in an orderly pattern that is related to the geology, landforms, relief, climate, and the native vegetation of the area. The soils in the project locations include CMD-Chilicotal-Monterosa, GHA-Glendale-Harkey, TOA-Tornillo loam, and CHD-Chamberino (U.S. Soil Conservation Service 1985).

Under the Proposed Action, construction activities such as excavation, grading, trenching, and use of heavy equipment will disturb soils and potentially cause soil compaction and erosion at the project location. Therefore the topic of soils has been retained for further analysis.

Cultural Resources

Section 106 of the NHPA, as amended (16 USC 470 *et seq.*), NPS Director's Order 28: *Cultural Resources Management (DO-28)*, NPS-28 and *Management Policies 2006* require the NPS to consider the effects of its undertakings on historic properties that are listed in or eligible for listing in the NRHP. To comply with these requirements, the NPS (1) determines if the proposed project has the potential to affect cultural resources, (2) establishes the "area of potential effects" (APE), (3) takes steps to identify cultural resources in the APE that are listed on the NRHP or are eligible for listing in the NRHP, and (4) considers ways to avoid, minimize, or mitigate adverse effects to any NRHP property. The potential to affect eligible cultural resources (historic properties) must be evaluated for the entire APE for a given undertaking. The APE is defined as the entire footprint of all project activities in each of the three project areas and may include the viewshed surrounding the project footprint. Cultural resources located in the APE of the three project areas include archeological sites, Mission 66-era structures, and a Mission 66-era cultural landscape. For this reason, the topic of cultural resources has been carried forward for further analysis in this EA.

Lightscape Management

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

Additional lighting would be required in association with the Proposed Action. Park developments and night lighting could potentially affect views from key resource areas such as Chisos Basin, Panther Junction, roads and trails. Therefore the topic of lightscape management has been retained for further analysis.

Park Operations

Parks must consider the potential effects of proposed actions on overall park operations. The park's aging infrastructure, unimproved sections of road, overcrowded parking lots, and utilities are no longer sufficient to support park operations. The current housing used by Park staff and the concessionaire is substandard and unable to accommodate the planned staff expansions by the U.S. Border Patrol. The number of staff working at the headquarters facility at Panther Junction has grown significantly which in turn has increased the need for office space and storage needs beyond what the current facility is able to accommodate.

Construction of new housing and other facilities within the park will have a measurable effect on the Big Bend National Park staff, concessionaries and U.S. Border Patrol; and how/where they conduct their work and how/where they live. For these reasons, the topic of park operations has been carried forward for further analysis in this EA.

Special Status Species

The Endangered Species Act of 1973, as amended, requires an examination of impacts on all federally-listed threatened and endangered species. In addition, the *2006 Management Policies* and NPS Director's Order 77: *Natural Resources Management Guidelines (DO-77)* require the NPS to examine the impacts on federal candidate species, as well as state-listed threatened, endangered, candidate, rare, declining, and sensitive species (NPS 2000).

The Big Bend gambusia, a federally listed endangered species, is found nowhere else in the wild other than the ponds near the Rio Grande Village project area. The entire wild population of the Big Bend gambusia exists in three small spring-fed ponds located in the vicinity of the Rio Grande Village Campground. The preferred alternative and the no action alternative have the potential to affect this species, therefore special status species are addressed as an impact topic in this EA.

Impact Topics Dismissed From Further Analysis

The following presents an overview of impact topics that were considered but ultimately dismissed from detailed analysis. Impact topics were dismissed from further analysis if it was determined that the project did not have the potential to cause significant measurable change to these resources and values. The regulatory context and baseline conditions relevant to each impact topic were briefly analyzed in the process of determining if a topic should be retained or dismissed from further analysis. An outline of background information used in considering each topic is provided below along with the reasons for dismissing each topic from further analysis.

Water Resources

NPS policies require protection of water quality consistent with the Clean Water Act. The purpose of the Clean Water Act is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." To enact this goal, the U.S. Army Corps of Engineers has been charged with evaluating federal actions that result in potential degradation of waters of the United States and issuing permits for actions consistent with the Clean Water Act. The U.S. Environmental Protection Agency (EPA) also has responsibility for oversight and review of permits and actions, which affect waters of the United States.

The construction of the Law Enforcement Complex at Panther Junction would alter the drainage patterns in the immediate vicinity of the proposed project. Naturally water flows to the west in the Panther Junction area. The contractor should ensure that drainage is diverted in as many directions as possible and not into a single ditch. In addition, it may be necessary to modify existing drainage

patterns in the area south west of the proposed Law Enforcement Complex to prevent erosions issues which may arise as a result of the proposed construction.

Water supply has been identified as a limiting factor for development in the park. According to the GMP, water sources at Panther Junction at times produce inadequate amounts of water to meet minimum TCEQ domestic water supply standards. The proposed new construction represents a potential increase in water demand, and may increase the number of water connections at Panther Junction, Rio Grande Village and Castolon. At the same time, the park concessioner, Forever Resorts, plans to transfer up to 24 employees from Panther Junction residences to housing outside the park. Additionally, water conservation measures and system improvements that increase water use efficiency are continually being implemented throughout the Park. Development of additional water supply sources may be required to meet future needs. Park staff will monitor water supply and use in the presence of development and staffing changes, and will implement additional conservation measures and/or restrictions as needed to meet TCEQ requirements. Should additional supply eventually be necessary, proposed actions will undergo environmental compliance and public review processes as required.

The proposed project areas do not contain surface waters, and are mostly dry, except for periodic runoff during storm events. Water quality, quantity, and drinking water are not expected to be adversely affected by the project. The size of the new facilities footprints would increase the amount of impervious surface in the area which would increase the erosion potential of the area; however the proposed project areas would not be located near surface waters so the Proposed Action would result in negligible effects to water resources. Because the Proposed Action would have a negligible net effect on water resources, this topic has been dismissed from further analysis.

Wilderness Values

The project area has not been recommended for wilderness designation and is not managed by the NPS as wilderness. As per *Management Policies 2006*, regardless of the category of wilderness, NPS "will take no action that would diminish the wilderness eligibility of an area possessing wilderness characteristics until the legislative process of wilderness designation has been completed. Until that time, management decisions will be made in expectation of eventual wilderness designation." Because the Proposed Action occurs in a developed area and is not likely to be designated a wilderness area, this topic has been dismissed from further analysis.

Topography and Geology

Management Policies 2006 state that the NPS will preserve and protect geologic features and geologic processes as integral components of park natural systems. The Big Bend National Park is located in the southern portion of Brewster County adjacent to the United States' border with Mexico. The project area is located within the general geographic area known as the Basin and Range physiographic province. The sparsely vegetated landscape reveals exposed rock and highly visible and varying strata. The regional topography is characterized by a long geological history. With some of the oldest rocks in the park dating 500 million years old, a wealth of geologic diversity and complexity can be found throughout the Park.

The proposed construction of new facilities would be located in areas of the Park that are presently developed and do not contain significant topographic or geologic features. The general area for the new facilities has been previously disturbed by past construction. Minor ground disturbance would be required to achieve the grade necessary to provide sustainable design for the proposed project infrastructure. Given that there are no significant geologic features in the project areas, and that the areas have been previously disturbed, the Proposed Action would result in negligible to minor temporary and permanent adverse effects to topography and geology. Because the Proposed Action

would have a net effect on topography and geology that would be negligible, this topic has been dismissed from further analysis.

Wetlands

For regulatory purposes, the term “wetlands” means those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

Executive Order 11990 *Protection of Wetlands* requires federal agencies to avoid, where possible, adversely impacting wetlands. *Management Policies 2006* and DO-77-1 *Wetlands Protection*, mandate that the NPS will strive to prevent the loss or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands. In accordance with DO-77-1, proposed actions that have the potential to adversely impact wetlands must be addressed in a Statement of Findings for wetlands.

No wetlands are located in the project areas; therefore, a Statement of Findings for wetlands will not be prepared. Because there are no wetlands within or adjacent to the project areas, this topic has been dismissed from further analysis.

Floodplains

Executive Order 11988 *Floodplain Management* requires all federal agencies to avoid construction within the 100-year floodplain unless no other practicable alternative exists. As per *Management Policies 2006* and NPS Director’s Order 77-2: *Floodplain Management* (DO-77-2), the NPS is mandated to strive to preserve floodplain values and minimize hazardous floodplain conditions. According to DO-77-2, certain construction within a 100-year floodplain requires preparation of a Statement of Findings for floodplains. According to the Federal Emergency Management Agency Flood Insurance Rate Map (FEMA 1985), the proposed U.S. Border Patrol housing, Law Enforcement Ranger Housing and expansion of the NPS Staff Seasonal RV Pad within Rio Grande Village, under the Proposed Action, are located inside the 100-year floodplain. The portion of the Proposed Action located inside the 100-year floodplain would be located in the vicinity of existing park facilities in the area. Construction would not alter the topography of the land, and the 100-year floodplain would not be altered.

All of the structures at Panther Junction are located on the uppermost end of an extensive bajada, or a series of coalescing alluvial fans. There are three specific flood-related hazards associated with this location; bank loss due to erosion, inundation from floodwaters, and destruction from debris flows (NPS 2000). According to a NPS technical memorandum on the subject, all of the structures at Panther Junction are at “some risk” (NPS 1995). The report goes on to say processes are slow in this environment and the present configuration may persist for many years, so any time afforded through protection may translate into a long, safe occupancy.

Because a portion of the new construction would occur in a designated floodplain or flood hazard area, a Statement of Findings for floodplains will be prepared. These Statements of Findings are included in Appendix C. Because the Statements of Findings conclude that there will be no adverse affect to the floodplain, the topic of floodplains has been dismissed from further analysis.

Air Quality

The Clean Air Act of 1963 (42 U.S.C. 7401 et seq.) was established to promote public health and welfare by protecting and enhancing the nation’s air quality. Section 118 of the Clean Air Act requires the park to meet all federal, state, and local air pollution standards. Because the Park is a national park encompassing more than 6,000 acres, it is classified as a Class I airshed under the Clean Air Act, as

amended. This stringent air quality classification protects Class I airsheds from air quality degradation. The Clean Air Act outlines the responsibility of federal land managers in protecting air quality and related values and resources including visibility, plants, animals, soils, water quality, cultural resources, and public health from adverse air pollution impacts. Under the 1990 Clean Air Act Amendments, the EPA sets limits for how much of certain pollutants can be in the air anywhere in the United States. These limits are referred to as the National Ambient Air Quality Standards (NAAQS). Six criterion air pollutants are monitored for compliance with NAAQS: Carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), fine particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂), and lead (Pb). New developments or operations that have the potential to be "major point sources" of air pollutants must apply for operating permits under the federal Title V operating permit program ("Part 71 Program"). Areas where pollutant levels are above the NAAQS limits, and therefore are not in compliance with the NAAQS, are termed "non-attainment areas." In non-attainment areas, local ordinances and state policies may require stricter monitoring of even minor sources of air pollution.

The Texas Commission on Environmental Quality (TCEQ) reviewed the project for General Conformity impact in accordance with 40 CFR Part 93 and Title 30, Texas Administrative Code § 101.30 indicates that the proposed action is located in Brewster County, which is currently unclassified or in attainment of the NAAQS for all six criteria air pollutants. Therefore, the general conformity does not apply. The only air quality monitor within Brewster County is located within the Park boundaries. Data recorded by the Park's air quality monitor for the 2006 calendar year include data for O₃ and PM_{2.5}. These data indicate that neither of these pollutants has exceeded the NAAQS in the overall park vicinity. Brewster County is in attainment for all NAAQS and the Proposed Action does not have the potential to be a "major point source" of air pollution under the Clean Air Act. Additionally, the project does not have the potential to affect visibility or any other air quality values defined for Class I airsheds.

Project demolition, construction, rehabilitation or repair may produce dust and particulate emissions but would not be substantial enough to affect air quality standards. Construction activities such as hauling materials and operating heavy equipment could result in temporary increases of vehicle exhaust, emissions, and fugitive dust (a type of non-point source air pollution - small airborne particles that do not originate from a specific point). Any exhaust, emissions, and fugitive dust generated from construction activities would be temporary and localized, and would likely dissipate. Any minimal dust and particulate emissions may be controlled by the application of standard dust mitigation techniques. Overall, the project could result in negligible degradation of local air quality, and such effects would be temporary, lasting only as long as construction occurred and would not affect the park's Class I air quality and related values.

None of the alternatives analyzed would have impacts greater than negligible. Therefore, air quality has been dismissed from further analysis.

Vegetation

According to the *Management Policies 2006*, NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of plants. The *Management Policies 2006* also contains management guidelines for avoiding the introduction of exotic plant species, and removal, when necessary, of exotic plant species from NPS units. Vegetation in the Panther Junction is brush grassland. Sotol and ceniza are the major brush species. Chino grama is the dominant grass. Other vegetation is lechuguilla, ocotillo, white-thorn acacia, mariola, prickly pear, ephedra, skeletonleaf goldeneye, guayacan, red grama, and sideoats grama (GMP 2004). Vegetation at Rio Grande Village with Tornillo soils cover broad, gently sloping areas that are mostly bare except for creosotebush. Some of the low, nearly level areas, where water stands after rains, support pockets of grass. Vegetation includes creosotebush, mesquite, lechuguilla, mariola, fourwing saltbrush, and tasajillo. The brush is scattered and much of the surface is bare. Grasses are scattered tobosa, burrograss, fluffgrass, threeawns, and sixweeks grama. There are small coppice dunes around the bases of the brushy plants (2004). Much of the surface at Castolon is bare.

Creosotebush, generally small and stunted is the dominant vegetation. Clumps of dog cacti and patches of lechuguilla are scattered across the surface. This soil supports a sparse stand of vegetation. The woody vegetation includes lechuguilla, dog cacti, creosotebush, leatherstem, prickly pear, and range ratany. Grasses are chino grama, threeawns, fluffgrass, and slim tridens. The lack of available seed sources, the dominance of creosotebush, and high ground temperatures during the summer make reestablishment of grasses difficult (2004).

Vegetation would be displaced, disturbed, and/or compacted in the areas of construction particularly in the footprint of buildings, paved surfaces, and utility line corridors. No trees will be removed for the project. The project area has been previously disturbed multiple times in the past by the construction of the existing facilities. Disturbed areas would be revegetated and rehabilitated following construction; therefore, removal and/or disturbance of vegetation in the project area is expected to result in negligible to minor adverse impacts to vegetation. Disturbed areas would also be reclaimed with native vegetation and would soon re-colonize with native micro- and meso-fauna similar to that currently existing. These disturbances would result in negligible, site-specific, adverse effects on vegetation. Because the net effects on vegetation of the Proposed Action would be negligible to minor and site-specific, this topic has been dismissed from further analysis.

Wildlife

Management Policies 2006, states that the NPS strives to maintain all components and processes of naturally evolving park unit ecosystems, including the natural abundance, diversity, and ecological integrity of animals. Common wildlife in project areas includes mule deer, javelina, coyote, fox, rodents, snakes, lizards, Mexican beaver and perching birds. Mule deer and javelina use Panther Junction as their home ranges. Coyote and fox use these areas for hunting and dens. Rodents, snakes and lizards also den in the area. The Mexican beaver is known to burrow in the riverbanks and feed on willows and other trees in Rio Grande Village. Many perching birds use the area for food, shelter and nesting (GMP 2004).

The Proposed Action will occur in areas that are presently developed and occupied by park residents, employees, U.S. Border Patrol, and visitors. The presence of humans, human-related activities, and structures have removed or displaced much of the native wildlife habitat in the project area which has limited the number and variety of wildlife occurrences in the immediate area of the Proposed Action.

During construction, noise would increase, which may disturb wildlife in the local area. Construction-related noise would be temporary and negligible to minor, and existing sound conditions would resume following construction activities. Because the net effects on wildlife would be negligible to minor and localized, this topic has been dismissed from further analysis.

Museum Collections

According to NPS Director's Order 24: *Museum Collections* (DO-24), the NPS must consider the potential for project-related impacts on museum collections (historic artifacts, natural specimens, and archival and manuscript materials). The DO-24 provides further policy guidance, standards, and requirements for preserving, protecting, documenting, and providing access to, and use of, NPS museum collections. The Park's museum collection facilities are at Panther Junction. However, those facilities are not within the area of construction and should not be affected by the construction. The materials collected from the mitigation of site 41BS611 will be housed in the museum collection facilities. Again, however, that will not adversely affect the collections. Therefore, this topic has been dismissed from further analysis.

Indian Trust Resources

Indian trust resources are assets held in trust by the United States for Native Americans. The U.S. Department of the Interior's (DOI) Secretarial Order 3175, *Departmental Responsibilities for Indian Trust Resources*, requires that any anticipated impacts to Indian trust resources from a proposed project or action by DOI agencies be explicitly addressed in environmental documents. The federal Indian trust responsibility is a legally enforceable fiduciary obligation on the part of the United States to protect tribal lands, assets, resources, and treaty rights; and it represents a duty to carry out the mandates of federal law with respect to American Indian and Alaska Native tribes.

There are no Indian trust resources at Big Bend National Park. Because there are no lands within the Park held in trust by the Secretary of the Interior for the benefit of Indians, this topic has been dismissed from further analysis.

Environmental Justice

The EPA defines environmental justice as 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 socioeconomic group; should bear a disproportionate share of the negative environmental consequences of industrial, municipal, or commercial operations or the execution of federal, state, local, or tribal programs and policies. Executive Order 12898, *General Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, requires that all federal agencies, to the extent practicable and permitted by law, consider environmental justice effects by identifying and assessing potential disproportionate adverse human health and environmental effects of programs, policies, and activities on minority and low-income populations.

The proposed project area is located in Brewster County. The U.S. Census Bureau 2000 statistics show that the population of Brewster County is 8,866. As of July 1, 2006 the U.S. Census Bureau estimates the population of Brewster County increased to 9,048 (Population Estimates, 2007). The annual unemployment rate for Brewster County has decreased from 3.9% in the year 2000 to 3.4% in the year 2006 (Texas Workforce Commission, 2007). According to the 2000 census 18.2% of the population was below the poverty level and minorities account for 18.9% of the county's total population.

Because the nature and location of the Proposed Action would not have the potential to have disproportionate health or environmental effects on minorities or low-income populations or communities as defined in EPA (1998) and CEQ (1997) environmental justice guidance, this topic was dismissed from further analysis.

Socioeconomics

The NPS DO-12 requires that NPS units consider potential direct and indirect impacts to the local economy, including impacts to neighboring businesses in the general project vicinity. The Proposed Action would neither change local and regional land use nor appreciably impact local businesses or other agencies. Implementation of the Proposed Action could provide a negligible beneficial impact to the local economy due to short-term increases in employment opportunities and revenues for local businesses and government. A private construction contractor would be hired by the NPS to conduct all construction activities. Construction-related benefits to the local economy through wages, overhead expenses, material costs, and profits would only last the duration of construction and would be minimal.

Because the Proposed Action does not have the potential to impact the socioeconomic environment of the area, this topic has been dismissed from further analysis.

Prime and Unique Farmlands

The Farmland Protection Policy Act of 1981, as amended, requires federal agencies to consider the effects of their actions on prime and unique farmland soils. Prime farmland is defined in the Federal Register, Vol.6, Parts 400-699, January 1, 2001, Section 657.5(a). Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops, and is also suitable for cropland, pastureland, rangeland, or forestland. It is not suited to urban or water use. Prime farmland has the soil quality, growing season, and moisture supply needed to economically produce sustained high yields of crops according to acceptable farming methods. Unique farmland is land other than prime farmland that is used for production of specific high-value food and fiber crops. The NRCS maintains data for prime and unique farmlands throughout the United States. However, federal lands are not included in the NRCS inventory.

Based on the Texas criteria for prime or unique farmlands (NRCS n.d.), soils in the project area are not suitable for supporting prime or unique farmland, and therefore this topic has been dismissed from further analysis.

Soundscape Management

In accordance with *Management Policies 2006* and NPS Director's Order 47: *Sound Preservation and Noise Management* (DO-47), an important component of the NPS's mission is the preservation of natural soundscapes associated with national park units. Natural soundscapes exist in the absence of human-caused sound. The natural ambient soundscape is the aggregate of all the natural sounds that occur in park units, together with the physical capacity for transmitting natural sounds. Natural sounds occur within and beyond the range of sounds that humans can perceive and can be transmitted through air, water, or solid materials. The frequencies, magnitudes, and durations of human-caused sound considered acceptable varies among NPS units as well as potentially throughout each park unit, being generally greater in developed areas and less in undeveloped areas. The proposed location for the new facilities and all associated construction activities would occur in areas of the Park that are heavily used by park staff, U.S. Border Patrol, and visitors. Sound generated by the short-term construction of the facilities may include sounds from construction efforts and other similar sounds. Construction-related sounds would have adverse but short-term and negligible impacts on visitor enjoyment of the park.

Because the area is already subject to human-caused sound and the facilities' short-term construction sounds and long-term use sounds are not expected to significantly increase the noise levels in the local area, this topic has been dismissed from further analysis.

Visitor Use and Experience

Big Bend National Park is open year-round. The park attendance averages between 300,000 and 340,000 visitors (and has been as high as 474,000 visitors) per year. The high periods of visitation occur at holidays throughout the year, with major peaks in November and December and during the school and spring season. Visitor use reaches a climax during the spring break period and tapers off after Easter. The average length of stay at the Park is three days (NPS 2004). Visitors to the park during construction of the Proposed Action may observe temporary fencing, construction equipment, and dust; however the effects would be short-term and localized.

The Proposed Action would not have impacts greater than negligible on visitor use and experience. Therefore, visitor use and experience was dismissed as an impact topic in this EA.

ALTERNATIVES CONSIDERED

During August of 2007, an interdisciplinary team of NPS employees met for the purpose of developing project alternatives. This meeting resulted in the definition of project objectives as described in the Purpose and Need, and a list of alternatives that could potentially meet these objectives. One Action alternative and the No Action alternative were identified as reasonable and were carried forward for further evaluation in this Environmental Assessment.

Alternatives Analyzed

The No Action Alternative – No Change in Current Conditions

This alternative presents the baseline, or current conditions, from which to evaluate impacts of other action alternatives. Under this alternative, no new housing and operations facilities would be constructed. NPS staff who would have moved into the new housing would continue to reside in substandard or temporary housing, as would concessionaire staff. The new U.S. Border Patrol staff that would have moved into the new housing would have to consider offsite locations, which would be detrimental to their mission, or make a decision on new housing within the Park outside of the NPS planning process. The existing U.S. Border Patrol staff would have to remain in substandard housing or new trailers would be brought in for them. Space for the storage and maintenance of operations equipment at Panther Junction would continue to be in short supply. In addition, office space would continue to be in short supply and the current crowded conditions would continue to persist.

Should the No Action alternative be selected, the NPS would continue to manage its operations as they currently exist without modifications or improvements. NPS DO-12 recommends that it is appropriate to interpret the No Action Alternative as a “continuation of existing conditions and activities.” That is, the No Action alternative should be taken to mean “no change” in current conditions, and it is meant to serve as a baseline against which other alternatives may be measured. NPS DO-12 recommends that the Proposed Action may be considered the Preferred Alternative when sufficient analysis has been conducted to evaluate the relative merits of each reasonable alternative.

The Proposed Action – Construct New Housing and Related Facilities

The proposed action is the construction of new housing and other facilities at Panther Junction, Rio Grande Village, and Castolon. Refer to Figure 2, Figure 3, and Figure 4 for location maps of the proposed projects. Specifically, the construction would include:

Panther Junction Location

- Duplex for Big Bend Natural History Association staff (one, new)
- Storage Building for Science and Resource Management staff and equipment (new)
- Gas Station/ Convenience Store expansion (laundry facilities, showers and parking)
- U.S. Border Patrol Housing (two, as replacement for existing trailers)
- U.S. Border Patrol Housing (two, new)
- Law Enforcement Complex, including

- U.S. Border Patrol Offices
- NPS Law Enforcement
- Ranger Staff Offices
- Detention Center
- Bus/Boat Bays
- River Operations and Search/Rescue Caches
- Driveway, parking lot and utilities
- Housing Complex, including
 - Concession Housing (up to 3 dorms)
 - NPS Staff Housing (seasonal)
 - Fire Dorm
 - Recreational Facility
 - Tennis Court

Rio Grande Village Location

- U.S. Border Patrol Housing (two, new)
- Law Enforcement Ranger Housing (one, new)
- Concession Duplex
- Expand NPS Staff Seasonal RV Pad area by adding 3 hookup sites

Castolon Location

- U.S. Border Patrol Housing (two, new)
- Law Enforcement Ranger Housing (one, new)

Alternatives Considered but Dismissed

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

- **Offsite NPS Housing.** Consideration was given to constructing a NPS staff housing facility outside of the Park. Several potential locations were evaluated in the Study Butte area just outside and northwest of the Park, but all of the sites had problems related to cost and availability of utilities, including water. However, the overriding factor was the distance. The approximate distance from Study Butte to Panther Junction, Castolon and Rio Grande Village is 35 miles, 51 miles and 67 miles, respectively. The construction of offsite housing was dismissed as a viable alternative for implementing the proposed project.
- **Offsite Private Housing.** Consideration was given to utilizing available housing outside of the Park. Residential areas on the outskirts of Big Bend National Park are extremely limited. The nearest communities are Study Butte and Terlingua, approximately one mile and eight miles outside of the west Park boundary, respectively. Due to the limited availability of offsite private housing combined with the distance, the utilization of offsite private housing was dismissed as a viable alternative for implementing the proposed project.

Figure 2 – Panther Junction Location Map

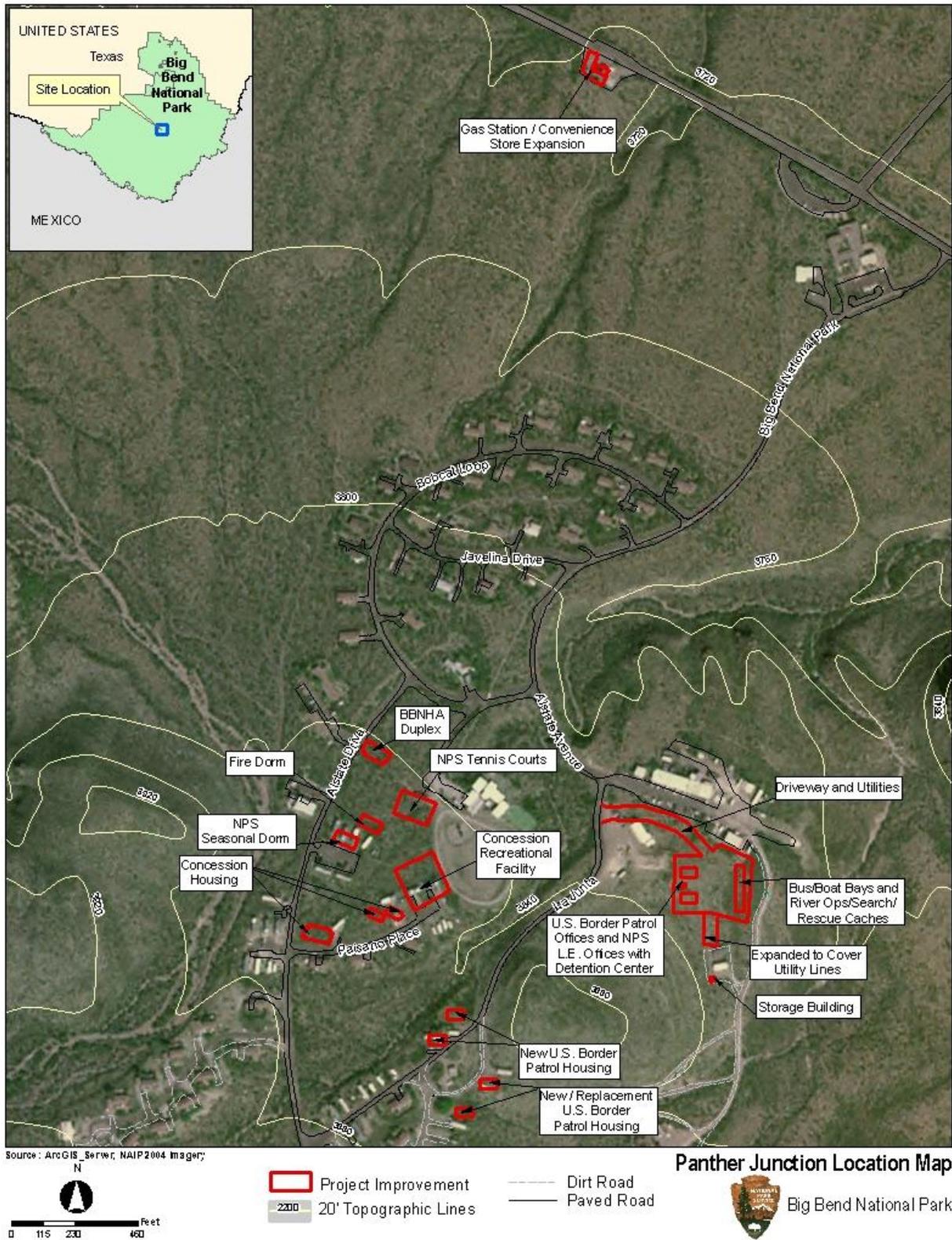


Figure 3 – Rio Grande Village Location Map

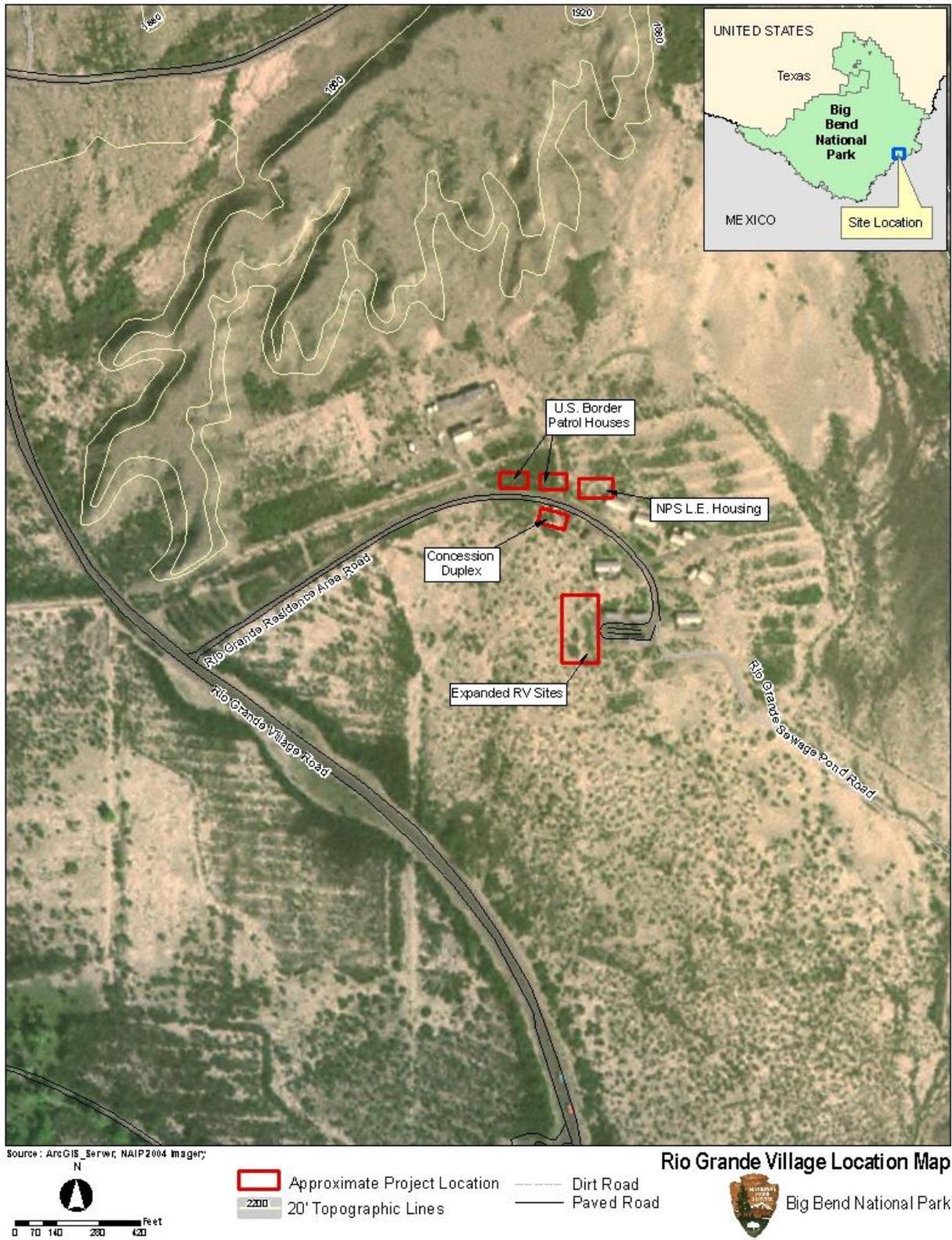
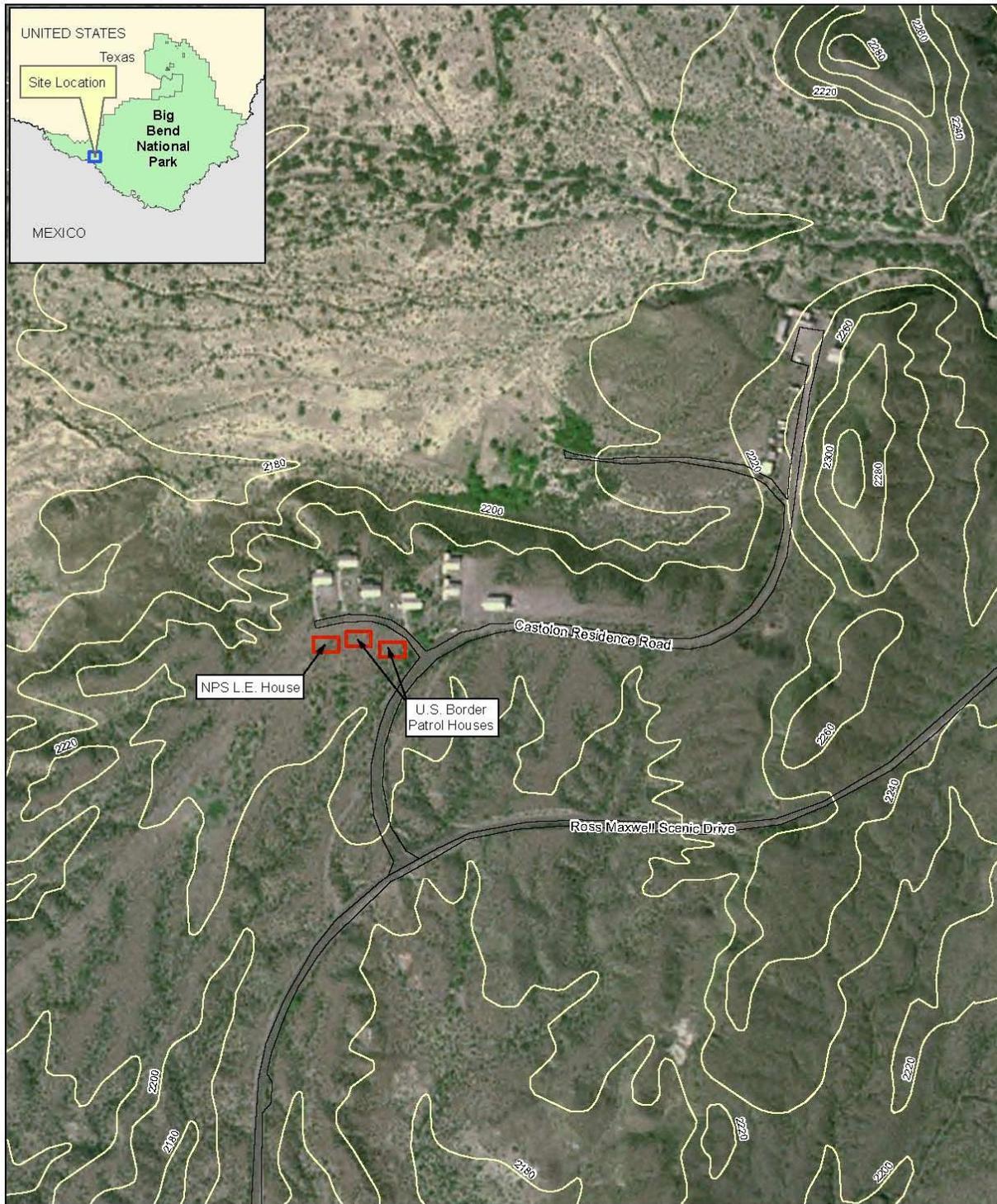
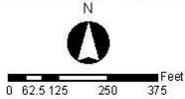


Figure 4 – Castolon Location Map



Source: ArcGIS_Server, NAIP 2004 Imagery



-  Approximate Project Location
-  20' Topographic Lines
-  Paved Road

Castolon Location Map
Big Bend National Park



Mitigation Measures for the Proposed Action

The following mitigation measures have been developed to minimize the degree and/or severity of adverse effects, and would be implemented during all activities associated with the Proposed Action, as needed:

- To mitigate adverse effects to site 41BS611 in the Panther Junction area, the Park has developed a Memorandum of Agreement (MOA) in consultation with the Texas State Historic Preservation Office (SHPO) to recover data from the site through archeological excavations that will take place prior to ground disturbing activities.
- NPS will consider compatible architectural designs for structures or buildings to be constructed in the view shed of any Mission 66 properties. Such compatible architectural designs will not detract from the values of the Mission 66 properties in Panther Junction or Rio Grande Village.
- Should construction unearth previously undiscovered cultural resources, work will be stopped in the area of discovery and the Park would consult with the state historic preservation officer and the Advisory Council on Historic Preservation, as necessary, according to §36 CFR 800.13, Post Review Discoveries. In the unlikely event that human remains are discovered during construction, provisions outlined in the Native American Graves Protection and Repatriation Act (1990) will be followed.
- The Park's Archeologist will meet with contractors during a preconstruction meeting to educate them about reporting any cultural resource materials they might encounter. The Archeologist will also conduct periodic inspections of ditches and other ground disturbances during construction.
- To minimize the amount of ground disturbance, staging and stockpiling areas would be located in previously disturbed areas, away from visitor use areas to the extent possible. All staging and stockpiling areas would be returned to pre-construction conditions following construction.
- Revegetation efforts would strive to reconstruct the natural spacing, abundance, and diversity of native plant species in disturbed areas. No foreign materials with the potential to introduce exotic plant species would be brought into the area.
- The contractor would coordinate with the Park's biologists if vegetation clearing required the removal of more than a few small trees. To reduce the amount of vegetation trampling, the construction crew would limit work to a use corridor of within six feet of each building footprint to the extent possible.
- Park-listed sensitive plants near the proposed project area would be flagged for avoidance prior to the start of construction work. Park biologists would collect seeds from sensitive plant species in the project area for a seed bank, and some of these seeds may be used in revegetating the project areas.
- All crew members and volunteers assisting in the construction efforts would be educated about the importance of avoiding impacts to sensitive resources that have been flagged for avoidance, which may include sensitive plants and cultural resources.
- Because disturbed soils are susceptible to erosion until revegetation is successfully established, standard erosion control measures such as jute matting would be used as necessary to minimize any potential soil erosion.
- According to *Management Policies 2006*, the NPS would strive to construct the facilities with a sustainable design to minimize potential environmental impacts. Development would not compete with or dominate Park features, or interfere with natural processes, such as the seasonal migration of wildlife or hydrologic activity. To the extent possible, the design and management

of the facilities would emphasize environmentally sensitive construction, use of nontoxic materials, resource conservation, recycling, and integration of visitors with natural and cultural settings.

- Mitigation for exterior facility lighting needs will be addressed with night-sky friendly fixtures, with shielding to maintain direct lighting only below the horizontal plane of the fixture.
- Appropriate measures will be taken in managing construction-related activities to prevent spills of hazardous materials.
- A commitment was made between the NPS and USFWS that the overall domestic water use at Rio Grande Village would remain within the range of variability experienced within recent years (Wellman 2007, Pine 2007). If water use monitoring indicates the potential to exceed the historical range, water use reduction would be made through system efficiencies and/or reductions in consumption.

Alternative Summaries

Table 1 summarizes the major components of the Proposed Action and the No Action Alternative, and it compares the ability of these alternatives to meet the project objectives, which are identified in the Purpose and Need Chapter of this document. As shown in the following table, the Proposed Action meets each of the objectives identified for this project, while the No Action Alternative does not address any of the objectives.

Table 1 – Alternatives Summary and Extent to which Each Alternative Meets Project Objectives

No Action Alternative	Proposed Action – Facility Construction
<p>Proposed facilities would not be constructed. The existing facilities would remain and be continued to be used as it is now. There would be no additional facilities to support U.S. Border Patrol Staff and housing needs would not be met for Park staff.</p>	<p>New housing and other facilities at Panther Junction, Rio Grande Village, and Castolon would be constructed for NPS staff, the concessionaire and U.S. Border Patrol staff.</p>
Meets Project Objectives?	Meets Project Objectives?
<p>No. Continuing the existing conditions would not provide for employee housing conditions that meet current standards. In addition, continuing the existing condition would not accommodate new NPS staff, concessionaire staff and the deployment of new U.S. Border Patrol staff assigned to the Park.</p> <p>Additionally, this alternative does not meet the Operations Prescription of the GMP for Big Bend National Park.</p>	<p>Yes. Constructing new housing and other facilities at Panther Junction, Rio Grande Village, and Castolon would meet the housing need of current and new NPS staff, concessionaire employees, and U.S. Border Patrol staff</p> <p>Additionally, the Proposed Action meets the Operations Prescription of the Big Bend National Park GMP.</p>

Table 2 summarizes the anticipated environmental impacts of each alternative. Only those impact topics that have been carried forward for further analysis are included in this table. The Environmental Consequences chapter of this EA provides a more detailed explanation of these impacts. Effects presented below are net effects of all actions and conditions associated with each alternative.

Table 2 – Environmental Impact Summary by Alternative

Impact Topic	No Action Alternative	Proposed Action – New Construction
Soils	No disturbance of soils.	Construction activities would have short-term, minor, localized, adverse direct impacts on soils in the project area. The soils in the vicinity would be permanently altered; however, long-term impacts would be minor and localized given the size of the area that would be affected.
Cultural Resources	No disturbance of cultural resources.	Construction of a new law enforcement center, proposed storage building, and burial of utilities in the vicinity of the maintenance area at Panther Junction would result in direct adverse effects on a portion of NRHP-eligible site 41BS611. Mitigation measures would reduce these adverse effects by recovering the data from the portion of the site to be impacted. Housing complex construction in Panther Junction and Rio Grande Village could have adverse visual effects on Mission 66 era properties. Consideration of compatible architectural design would ensure that the new construction would not detract from the values of any Mission 66 properties in the viewshed of the new construction.
Lightscape Management	No change in existing conditions of lightscape and ambient light.	Permanent lighting would be added to the housing and law enforcement complex, which would result in long-term, negligible, localized and adverse impacts to the natural lightscape. These impacts would be significantly minimized by incorporating natural lightscape preservation techniques.

Impact Topic	No Action Alternative	Proposed Action – New Construction
Park Operations	Minor to moderate adverse effects. NPS staff who would have moved into the new housing would continue to reside in substandard or temporary housing, as would concessionaire staff. Space for the storage and maintenance of operations equipment at Panther Junction would continue to be in short supply. In addition, office space at the Park headquarters would continue to be in short supply. These substandard conditions for staff would not be conducive to Park operations.	Minor to moderate beneficial effects from improved working conditions and better employee housing conditions. NPS and concessionaire staff would be moved into new housing and would no longer continue to reside in substandard or temporary housing. Adequate office space for staff and storage space for operations equipment would be provided at the Panther Junction headquarters.

Identification of the Environmentally Preferred Alternative

The Environmentally Preferred Alternative is determined by applying the criteria suggested in the NEPA, which guides the CEQ. The CEQ provides direction that “[t]he environmentally preferable alternative is the alternative that would promote the national environmental policy as expressed in NEPA’s Section 101:

- fulfill the responsibilities of each generation as trustee of the environment for succeeding generations;
- assure for all generations safe, healthful, productive, and esthetically and culturally pleasing surroundings;
- attain the widest range of beneficial uses of the environment without degradation, risk of health or safety, or other undesirable and unintended consequences;
- preserve important historic, cultural and natural aspects of our national heritage and maintain, wherever possible, an environment that supports diversity and variety of individual choice;
- achieve a balance between population and resource use that will permit high standards of living and a wide sharing of life’s amenities; and
- enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.

The No Action alternative does not meet the project purpose because it retains facilities that are not up to standard to house NPS staff and concessionaire staff, as well as meet the needs of the U.S. Border Patrol. This alternative causes ongoing impacts to Park operations.

The Proposed Action to construct new facilities is the Environmentally Preferred Alternative, because it facilitates the best balance between Park operations and preservation of resources. No new information came forward from public scoping or consultation with other agencies to necessitate the development of any new alternatives, other than those described and evaluated in this document.

Because it meets the Purpose and Need for the project, the project objectives, and is the Environmentally Preferred Alternative, the Proposed Action to construct new facilities is also recommended as the NPS Preferred Alternative. For the remainder of the document, the Proposed Action to construct new facilities will be referred to as the Preferred Alternative.

ENVIRONMENTAL CONSEQUENCES

This chapter analyzes the potential environmental consequences, or impacts, that would occur as a result of implementing the Preferred Alternative as well as potential impacts of the No Action Alternative. Impact topics analyzed for this project have been identified on the basis of federal laws and regulations, NPS DO's, *Management Policies 2006*, and NPS staff knowledge of resources at Big Bend National Park. A detailed discussion of the regulatory context, affected environment, and potential impacts of each alternative on resources relevant to each topic analyzed is provided below. The discussion of regulatory context provides background on agency mandates and responsibilities with regard to each impact topic. The "affected environment" statement provides a baseline of existing conditions and general environmental context for analyzing potential impacts of each alternative.

Methodology

Topics analyzed in this chapter include soils, cultural resources, lightscape management and park operations. Direct, indirect, and cumulative effects, as well as impairment are analyzed for each resource topic carried forward. Potential impacts are described in terms of type, context, duration, and intensity. General definitions are listed below. Additionally, more specific impact thresholds are provided for each resource topic in the sections that follow.

- **Type** describes the classification of the impact as either beneficial or adverse, and direct or indirect:
 - **Beneficial:** A positive change in the condition or appearance of the resource or a change that moves the resource toward a desired condition
 - **Adverse:** A change that moves the resource away from a desired condition or detracts from its appearance or condition
 - **Direct:** An effect that is caused by an action, occurring in the same time and place as the action
 - **Indirect:** An effect that is caused by an action but is later in time or farther removed in distance, but is still reasonably foreseeable
- **Context** describes the area or location in which the impact would occur. Are the effects site-specific, local, regional, or even broader?
- **Duration** describes the length of time an effect would occur, either short-term or long-term:
 - **Short-term** impacts generally last only during construction, and the resources resume their preconstruction conditions following construction.
 - **Long-term** impacts last beyond the construction period, and the resources may not resume their pre-construction conditions for a longer period of time following construction.
- **Intensity** describes the degree, level, or strength of an impact. For this analysis, intensity has been categorized into negligible, minor, moderate, and major. Because definitions of intensity vary by resource topic, intensity definitions are provided separately for each impact topic analyzed in this EA.

Impairment: *Management Policies 2006* require analysis of potential effects to determine whether or not actions would impair park resources. The fundamental purpose of the National Park system, established by the NPS Organic Act of 1916 and reaffirmed by the General Authorities Act, as amended, begins with a mandate to conserve park resources and values. NPS managers must always seek ways to avoid, or to minimize to the greatest degree practicable, adversely impacting park

resources and values. However, these laws give the NPS the management discretion to allow certain impacts to park resources and values when necessary and appropriate to fulfill the purposes of a park. However, that discretion is limited by the statutory requirement that the NPS must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. The prohibited impairment is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values. An impact to any park resource or value may constitute impairment if it has 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 GMP or other relevant NPS planning documents.

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

Unacceptable Impacts: The impact threshold at which impairment occurs is not always readily apparent. Therefore, the NPS applies a standard that offers greater assurance that impairment will not occur by avoiding unacceptable impacts. These are impacts that fall short of impairment, but are still not acceptable within a particular park's environment. Park managers must not allow uses that would cause unacceptable impacts; they must evaluate existing or proposed uses and determine whether the associated impacts on park resources and values are acceptable.

Virtually every form of human activity that takes place within a park has some degree of effect on park resources or values, but that does not mean the impact is unacceptable or that a particular use must be disallowed. Therefore, for the purposes of these policies, unacceptable impacts are impacts that, individually or cumulatively, would

- Be inconsistent with a park's purposes or values, or
- Impede the attainment of a park's desired future conditions for natural and cultural resources as identified through the park's planning process, or
- Create an unsafe or unhealthful environment for visitors or employees, or
- Diminish opportunities for current or future generations to enjoy, learn about, or be inspired by park resources or values, or
- Unreasonably interfere with
 - park programs or activities
 - an appropriate use
 - the atmosphere of peace and tranquility, or the natural soundscape maintained in wilderness and natural, historic, or commemorative locations within the park
 - NPS concessioner or contractor operations or services.

In accordance with Management Policies, park managers must not allow uses that would cause unacceptable impacts to park resources. To determine if unacceptable impact could occur to the resources and values of Big Bend National Park, the impacts of proposed actions in this EA were evaluated based on the above criteria. A determination on unacceptable impacts is made in the Conclusion section for each of the resource topics carried forward in this chapter.

Cumulative Effects: The CEQ regulations (40 CFR 1508.7) require assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions." Cumulative impacts are considered for both the No Action and Preferred Alternative.

Cumulative impacts were determined by combining the impacts of the No Action Alternative and the Preferred Alternative with other past, present, and reasonably foreseeable future actions. Therefore, it was necessary to identify other ongoing or reasonably foreseeable future projects at Big Bend National Park, as applicable. The geographic scope of this analysis includes actions within the developed areas at Panther Junction, Rio Grande Village and Castolon. Given this, the projects listed below were identified for the purpose of conducting the cumulative effects analysis. Some future projects on the list may not be currently funded but were taken from the GMP as projects that are expected to be implemented within the reasonably foreseeable future.

Panther Junction

- New Science and Resource Management Building. Complete
- Expansion of Visitor Center. At present, expansion of the existing visitor center is underway.
- New Curatorial and Resource Management Office Building. Construction of a new Curatorial and Resource Management Office Building is currently underway. The location is near the site of the existing facility. Completion of this facility is expected in 2008.
- Replace/Expand the Existing Service Station and Convenience Store. New construction related to the existing service station and convenience store at Panther Junction, as identified in the 2004 GMP, is not yet funded and a construction date has not yet been set.
- New Multi-Use Trail, Picnic Area and Parking.

Rio Grande Village

- New Pond. Complete
- New Water System. Construction of a new water system is currently underway. This system consists of a new well, an operations building and a distribution system. Completion of this system is expected by Fall 2008.
- Expand RV Hookup Area. Expansion of the RV area at Rio Grande Village, as identified in the 2004 GMP, is not yet funded and a construction date has not yet been set.
- Wetland Restoration. Begun about ten years ago, the restoration of the wetland habitat in the vicinity of the Big Bend gambusia refugium has been an ongoing process. Current plans call for restoration of natural contours and construction of berms to direct runoff.

Castolon

- Relocate Campsites. Relocation of several campsites and construction of a new egress road from the campground, as identified in the 2004 GMP, are not yet funded and a construction date has not yet been set.

Soils

Management Policies 2006 state that the NPS will strive to understand and preserve the soil resources of park units and to prevent, to the extent possible, the unnatural erosion, physical removal, or contamination of the soil, or its contamination of other resources. These policies further state that “[m]anagement action will be taken by superintendents to prevent or at least minimize adverse, potentially irreversible impacts on soils. Soil conservation and soil amendment practices may be implemented to reduce impacts. Importation of off-site soil or soil amendments may be used to restore damaged sites. Off-site soil normally will be salvaged soil, not soil removed from pristine sites, unless the use of pristine site soil can be achieved without causing any overall ecosystem impairment.”

The soils at the project locations are identified by the U.S. Department of Agriculture, Natural Resources Conservation Service (NRCS) as Chilicotal-Monterosa at Panther Junction; Glendale-Harkey and Tornillo loam at Rio Grande Village; and Chamberino at Castolon. Chilicotal soils are well drained. Surface runoff is medium on undisturbed soils. Wind and water erosion are only slight hazards because of gravel on the surface. Limitations for excavating for foundations are moderate because of slope; for septic systems slight. No data is provided for limitations for underground utilities. Monterosa soils are well drained. Surface runoff is medium. Wind and water erosion are only slight hazards due to the gravel and cobbles on the soil surface. The cemented pan of the Monterosa soils presents some problems in excavating for foundations, septic systems, and underground utilities. The short, steep slopes present problems in leveling areas for building sites. Both Glendale and Harkey soils are well drained with slow to medium surface runoff and moderate wind erosion hazard for undisturbed soils. Occasional flooding is the major limitation for campsites and picnic areas. The soils are highly erodible, but the major limitation for building sites is the hazard of flooding, which is difficult to overcome. Tornillo soil is highly erodible and well drained. Where vegetative cover exists, surface runoff is slow to medium. This soil receives runoff from areas higher on the landscape, and during high intensity rainstorms it is flooded by sheet water as much as several inches deep. This brief flash flooding occurs about once every three to eight years. The surface of the soil crusts and seals over so that most of the rainfall runs off and little water enters the soil. This soil is very erosive and has narrow, deep arroyos in many areas. Wind erosion is a moderate hazard, and water erosion is a severe hazard. The Chamberino soil is well drained. Surface runoff is medium. Wind and water erosion are only slight hazards because of the cobbles and gravel on the surface.

Methodology

Intensity Level Definitions

Impact analyses on soils are based on NRCS data. The thresholds of change for the intensity of an impact on soils are defined as follows:

- Negligible:** Soils would not be affected or the effects on soils would be below or at the lower levels of detection. Any effects to soils would be slight.
- Minor:** The effects on soils would be detectable. Effects on soil area would be small. Mitigation may be needed to offset adverse effects and would be relatively simple to implement and likely be successful.

- Moderate:** The effect on soil would be readily apparent and result in a change to the soil character of the soils over a relatively wide area. Mitigation measures would be necessary to offset adverse effects and they would likely be successful.
- Major:** The effect on soil would be readily apparent and substantially change the character of the soils over a large area in and out of the Park. Mitigation measures to offset adverse effects would be needed, they would be extensive, and their success could not be guaranteed.

The thresholds of change for the duration of an impact on soils are defined as follows:

Short-term: Soil would recover in less than three years.

Long-term: It would take more than three years for soil to recover.

Impacts of Alternative A (No Action)

Impacts Analysis

No facilities would be constructed under this alternative; therefore, soils within the project area would not be impacted, and current conditions would remain the same.

Cumulative Effects

Although other past, present, and reasonably foreseeable future actions may affect soils in the area, Alternative A would have no direct or indirect impacts on soils and therefore would not contribute to the effects of other actions. Consequently, there would be no cumulative impacts to soils under the No Action Alternative.

Conclusion

Alternative A would have no direct or indirect impacts on soils. Because there would be no impacts to resources or values whose conservation are (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 GMP or other relevant NPS planning documents, there would be no impairment of the Park's soils or values under the No Action Alternative. Implementation of this alternative would not result in any unacceptable impacts and is consistent with *NPS Management Policies 2006*.

Impacts of Alternative B (Preferred Alternative)

Impacts Analysis

At Panther Junction, located within the Chilicotal-Monterosa association, construction of housing and recreational facilities, construction of operations facilities, a new gravel road entering the proposed law enforcement complex, and placement of utilities underground would result in less than 10 acres of new soil disturbance.

Suitability of soils for development in the area varies. The major limitation for development is likely presented by flooding and water erosion in Glendale-Harkley and Tornillo soil types, where housing and expansion of a RV are proposed at Rio Grande Village. The proposed construction would disturb approximately 0.5 acre.

At Castolon, located within the Chamberino soil type, construction of U.S. Border Patrol housing would disturb less than one acre.

Potential impacts to soils would be primarily associated with surface disturbance during construction activities. Soil disturbance during construction would occur from vegetation clearing, grading, and excavation. Exposed soils are vulnerable to erosion during rainfall and can become suspended in storm water runoff. However, best management practices (BMPs); such as the use of silt fences, seeding disturbed areas with native vegetation, and constructing storm drains in depressions along the new section of gravel road to allow for surface water flow; would be implemented to control erosion and sediment runoff, minimizing construction-related effects. Use of construction equipment might cause compaction of near surface soils, resulting in increased soil impermeability and surface water runoff. To minimize the potential for compaction in the project area, where practicable heavy equipment would be kept on the road adjacent to the construction sites, and construction would not be conducted under saturated soil conditions. Direct impacts to soils related to construction activities would be short-term, minor, localized and adverse under this alternative.

Cumulative Effects

Cumulative impacts to soils could occur from the past, present, and reasonably foreseeable future activities. Past and present projects affecting soils have included park operations, construction of new facilities and wetland restoration. Park developments in the vicinity of the project area have also altered soils. Adverse impacts to soils have resulted from construction disturbance and compaction. Increases in impervious surfaces have caused subsequent increases in surface water runoff and erosion potential. Wetland restoration has benefited soils with the removal of pavement, allowing natural infiltration and restoration of hydric soil conditions.

Future projects that would affect soils include wetland restoration, replacement/expansion of the existing service station and convenience store, expansion of the RV hookup area, construction of a new visitor center and relocation of the campsites. Wetland restoration would restore the hydric conditions. Campsite relocations would also benefit soils through the removal of impervious surfaces, allowing for natural soil infiltration. Expansion of the RV campground and construction/expansion/replacement of facilities would adversely impact soils by increasing impervious surfaces and subsequently increasing surface water runoff and erosion potential.

Overall, the cumulative effects of past, present, and foreseeable future projects on soils would be minor, localized, and adverse over the short term from construction disturbance and moderate, localized, and both adverse and beneficial over the long term. The Preferred Alternative would contribute to short-term adverse impacts to soils; however, the contribution would be minor overall and would not change the intensity of cumulative effects.

Conclusion

Construction activities under the Preferred Alternative would have short-term, minor, localized, adverse direct impacts on soils in the project area. The soils in the vicinity would be permanently altered; however, long-term impacts would be minor and localized given the size of the area that would be affected. Cumulative impacts on soils from the Preferred Alternative; in conjunction with past, present, and future activities; would be minor, localized, and adverse over the short-term from construction disturbance and moderate, localized, and both adverse and beneficial over the long-term. Because there would be no impacts to resources or values whose conservation are (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 GMP or other relevant NPS planning documents, there would be no impairment of the Park's soils resources or values under the Preferred Alternative. Implementation of this alternative would not result in any unacceptable impacts and is consistent with NPS *Management Policies 2006*.

Cultural Resources

Section 106 of the NHPA, as amended (16 USC 470 *et seq.*), NPS Director's Order 28: *Cultural Resources Management* (DO-28), NPS-28 and *Management Policies 2006* require the NPS to consider the effects of its undertakings on historic properties that are listed in or eligible for listing in the NRHP. To comply with these requirements, the NPS (1) determines if the proposed project has the potential to affect cultural resources, (2) establishes the "area of potential effects" (APE), (3) takes steps to identify cultural resources in the APE that are listed on the NRHP or are eligible for listing in the NRHP, and (4) considers ways to avoid, minimize, or mitigate adverse effects to any NRHP property. The potential to affect eligible cultural resources (historic properties) must be evaluated for the entire APE for a given undertaking. The APE is defined as the entire footprint of all project activities in each of the three project areas and may include the viewshed surrounding the project footprint.

CEQ regulations and the DO-12 also call for a discussion of the appropriateness of mitigation, as well as an analysis of how effective the mitigation would be in reducing the intensity of a potential impact (e.g., reducing the intensity of an impact from major to moderate or minor). Any resultant reduction in intensity of impact due to mitigation, however, is an estimate of the effectiveness of mitigation under NEPA only. It does not suggest that the level of effect as defined by Section 106 is similarly reduced. Although adverse effects under Section 106 may be mitigated, the effect remains adverse.

In order for a cultural resource to be listed in the NRHP, it must meet one or more of the following criteria of significance: A) be associated with events that have made a significant contribution to the broad patterns of our history; B) be associated with the lives of persons significant in our past; C) embody the distinctive characteristics of a type, period, or method of construction, or represent the work of a master, or possess high artistic value, or represent a significant and distinguishable entity whose components may lack individual distinction; or D) have yielded, or be likely to yield, information important in prehistory or history. In addition, the historic property must possess integrity of location, design, setting, materials, workmanship, feeling, and association (National Register Bulletin, *How to Apply the National Register Criteria for Evaluation*). The NRHP contains a wide range of property types, including historic buildings and structures, archeological sites, groups of buildings or sites forming historic districts, cultural landscapes, and individual objects.

When a federal undertaking has the potential to affect properties listed in or eligible for listing in the NRHP, Section 106 of the NHPA and its implementing regulations (36 CFR 800) require federal agencies to consult with the SHPO and affiliated tribes, as appropriate. Through a Nationwide Programmatic Agreement with the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers, the NPS has defined the process under which parks consult with the appropriate interested parties.

Affected Environment

The proposed construction activities at Panther Junction, Rio Grande Village, and Castolon are in areas of the Park that have been subjected to multiple cultural resource inventories and surveys. To determine if cultural resources would be affected by the Proposed Action, background material were reviewed to determine if archeological or historical resources were within the APE; and field verification of the location and present condition of archeological resources was completed by the Park Archeologist. Background material included review of the Texas Historic Sites Atlas, review of regional literature including Alex (2006a, 2006b), Baskin (1977), Bradford (1979), Corrick and Alex (1993), Galbraith (2002), Kelley et al. (1947), and Mallouf (1985). Field verification of each of the various project areas was undertaken in conjunction with other duties over the past 18 months (personal communication Thomas C. Alex 2007).

The cultural resources located in the APE of the three project areas include archeological sites, Mission 66-era structures, and a Mission 66-era cultural landscape. These resources have been identified through cultural resource surveys, surface inspection, and inventories over the past 29 years. These efforts identified the two archeological sites (41BS611 and BIBE00321) within the APE of the various proposed construction areas at Panther Junction. Site 41BS611 was identified during an archeological survey of the then-proposed maintenance area (Baskin 1977). The site covers a large portion of a terrace overlooking an arroyo. It consists of a scatter of lithic tools and debitage with clusters of ground stone and a series of hearths, some of which are buried. The site has been investigated several times (Alex 2006b; Baskin 1977). Dart points recovered from the site date to the Archaic period, and radiocarbon assays taken from several of the features at the site resulted in dates ranging from A.D. 1490 to A.D. 1950. Together these dates suggest that the site was occupied repeatedly for short periods over a long span of time. Although the surface of the site has been disturbed, previous investigations have demonstrated that the site contains buried deposits to a depth of 20 to 40 cm below the present ground surface. In 1998, the Park determined the site eligible for the NRHP in consultation with the SHPO. The site is within the area of the proposed law enforcement center and the proposed storage building for Science and Resource Management staff and equipment as well as where a line will be placed to bury utilities.

The other site (BIBE00321) within the APE at Panther Junction is small and heavily disturbed. It is situated within the area where the proposed U.S. Border Patrol housing will be located. The site was recorded during surface inspections by the Park's cultural resource staff and contains a few lithic artifacts. Because the site lacks integrity, it is not eligible for the NRHP. The area where the proposed additional housing for NPS and concessionaire staff will be constructed has been inspected by the Park Archeologist (personal communication Thomas C. Alex 2007). The area is badly disturbed by water lines, streets, and other facilities. No sites have been found in this area.

Several structures, the road, and some employee housing at Panther Junction were built as part of the Mission 66 initiative undertaken by NPS in the late 1950s and 1960s. In anticipation of NPS' 50th anniversary in 1966, its director Conrad Wirth proposed a ten-year plan that would alter traditional park design by moving away from facilities constructed with natural materials in a rustic design to designs that used textured concrete with panels of stone veneer, painted steel columns, and lat roofs (Galbrieth 2002). Designed roadways, campgrounds, RV parks, restrooms, and other features were incorporated into overall designs for specific areas. As well, visitor centers to educate the public were considered vital to accommodate the increased visitation to the parks after World War II. The Mission 66 construction is only just turning 50 years, and NPS, in its stewardship role, is completing a contextual study for evaluating the significance of its Mission 66 properties. At Panther Junction, the Mission 66 properties have not yet been evaluated under that study, but include the visitor center, employee housing, and the original road circulation system. None of them are within the footprint of the proposed actions at Panther Junction that are the subject of this assessment. However, the roadbed adjacent to the U.S. Border Patrol housing was part of the Mission 66 construction. The roads and structures in the area of the NPS and concession housing are of recent construction and are not part of the Park's Mission 66 features in the Park. Some of the structures to be built in this housing complex for NPS, Big Bend Natural History Association, and the concessionaires, however, may be in the viewshed of Mission 66 employee housing.

Several archeological sites have been recorded in Rio Grande Village. However, an archeological survey close to the location of the additional employee housing in Rio Grande Village did not locate any archeological materials at that location (Corrick and Alex 1993). The Rio Grande Village housing area is located on a portion of the Rio Grande floodplain where early 20th century irrigated farming occurred and despite repeated plowing of this area no archeological materials have been found. Subsequent inspections of the project area by the Park Archeologist did not reveal any archeological evidence (personal communication Thomas C. Alex 2007).

Rio Grande Village has been inventoried by the NPS as a Mission 66 cultural landscape (Carr 2007). Features of the landscape include the roadway system, campground, RV park, store, picnic area near Daniel's Farm House, Daniel's Farm House, historic plantings of Huisache, cottonwood, and other species, pumphouse and irrigation system, springs and wetlands, views of the mountains and the Rio Grande, employee housing (structures 414 and 415), and the road to the employee housing. Much of the complex was completed between 1963 and 1966 although Daniel's Farm House and a few of the irrigation ditches were completed before the land was deeded to the NPS. While the eligibility of the landscape for listing in the NRHP will not be completed until the NPS Mission 66 theme study is completed in the near future, the inventory rated the integrity of the Rio Grande Village as medium and its condition as fair (Galbraith 2002). These moderate ratings are based on the fact that some of the irrigation system was relocated in past years, new plant species (adapted to the Chihuahuan desert) have been used to replace dead cottonwoods, some features (such as the amphitheater) have been relocated, and other features (such as the store and the employee houses) have had new additions or modifications. Of the features in this cultural landscape, the road to the employee housing and the two employee houses are within the APE of the proposed additional housing. The housing will be adjacent to the cul-de-sac at the end of the road and within view of the two houses although they will not be readily visible to visitors. The two concrete block houses (numbers 414 and 415) were completed in 1966 and the road was completed about the same time. The cottonwood plantings around these two houses died in the 1980s and have not been replaced. Their composition roofs were replaced with metal roofs at some point in the past but they remain in their original locations. Both are considered contributing features of the Rio Grande Village cultural landscape (Galbraith 2002). The remaining employee housing, including RV shelters, were built well after the Mission 66 era. The employee housing road was also built in 1966 and has retained its integrity. Like the houses, it is a contributing feature of the Rio Grande Village cultural landscape.

The proposed work at Castolon is to be completed within the existing complex for employee housing. The employee housing complex is approximately one-half mile north of the Castolon Historic District, a district listed on the NRHP in 1974. The housing will be constructed in an area that already houses employees. The original location and placement of the employee housing was selected to reduce the visual impact of new structures on the Historic District. The housing is only visible from the Ross Maxwell Scenic Highway as it approaches the Historic District and the visual effect would be negligible. Once visitors reach the Visitor Center, the housing is not visible from the Historic District and outside the APE of the proposed new construction.

The housing complex and the location of the two proposed new U.S. Border Patrol housing units near Castolon overlie site 41BS676. The site was identified in a 1979 survey for the proposed development for the construction of the housing complex (Bradford 1979). Sitting on a gravel flat above Castolon with very shallow soils, the site was described as a light scatter of chert and chalcedony flakes and debitage across a fairly broad area. The site was interpreted as a lithic procurement or processing area. At that time it was recommended for testing or surface collection (Bradford 1979). The site was re-visited in the late 1980s as part of the reconstruction of the Ross Maxwell Scenic Road (Kibler, Corrick and Alex, and Garcia 1990). During that visit, the site was found to be highly eroded. Lithics at the site averaged only one or two fragments per square meter. The site was not recommended for further work because of its eroded condition and was not recommended as eligible for listing in the NRHP. In 1996, as part of the Park's air quality monitoring program, a monitoring station was installed adjacent to the Castolon Ranger residence area and near where the proposed new U.S. Border Patrol housing would be built. NPS Archeology Technician Donald W. Corrick examined the project area and found ground surface visibility at 95 percent. He also examined an area about 100 feet west and south of the residential area road that included the area of the proposed new U.S. Border Patrol housing. The surface consisted of shallow soil covered by desert pavement gravels that had been deflated by sheet wash and aeolian erosion. Other surface impacts to the site included disturbance by roads, an old airstrip, vehicle traffic, installation of underground utilities, and by blading and materials storage during construction of the NPS housing. Based on the site's lack of integrity, it was not recommended as eligible for the NRHP.

Historic Structures

Intensity Level Definitions

DO-28 defines a historic structure as "a constructed work...consciously created to serve some human activity". Mission 66-related structures and buildings are present in Panther Junction. However, they have not yet achieved 50 years of age and have not been evaluated for listing in the NRHP. Nonetheless, NPS Intermountain Region imposed a moratorium on development affecting Mission 66 structures, stipulating that activities that may affect such structures are subject to the provisions of Section 106 until all Mission 66 properties are evaluated for the NRHP. The methodology used for assessing impacts to these cultural resources is based on how the project will affect features for which the structures may be significant. The thresholds for this impact assessment are as follows:

- Negligible:** Impact(s) is at the lowest levels of detection – barely perceptible and not measurable. For purposes of Section 106, the determination of effect would be "no adverse effect."
- Minor:** Adverse: Alteration of a feature(s) would not diminish the overall integrity of the resource. The determination of effect for Section 106 would be "no adverse effect."
- Beneficial: Stabilization/preservation of features in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. The determination of effect for Section 106 would be "no adverse effect."
- Moderate:** Adverse: Alteration of a feature(s) would diminish the overall integrity of the resource. The determination of effect for Section 106 would be "adverse effect." A MOA is executed among the NPS and the Texas State Historic Preservation Office and, if necessary, the Advisory Council on Historic Preservation in accordance with 36 CFR 800.6(b). Measures identified in the MOA to minimize or mitigate adverse impacts reduce the intensity of impact under NEPA from major to moderate.
- Beneficial: rehabilitation of a structure in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. The determination of effect for Section 106 would be "no adverse effect."
- Major:** Adverse: alteration of a feature(s) would diminish the overall integrity of the resource. The determination of effect for Section 106 would be "adverse effect." Measures to minimize or mitigate adverse impacts cannot be agreed upon and the NPS and applicable state or tribal historic preservation office and/or Advisory Council are unable to negotiate and execute a MOA in accordance with 36 CFR 800.6(b).
- Beneficial: restoration of a structure in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties. The determination of effect for Section 106 would be "no adverse effect."

Impacts of Alternative A (No Action)

Impacts Analysis

The No Action alternative would result in negligible impacts to the Mission 66-related structures and features in Panther Junction and Rio Grande Village because the NPS would not undertake construction of new facilities. Since no historic resources have been identified at the Castolon location, there would be no impacts to historic resources at this location.

Cumulative Effects

In the future, a new visitor center will be constructed at Panther Junction and other administrative, maintenance, and storage facilities are proposed in the Park's GMP. However, that plan notes that prior to such actions, the present Mission 66 visitor center would be evaluated for the NRHP. If determined eligible, any changes to the building would be done in such a manner as to not impact the character-defining features. Rehabilitation activities would have a long-term negligible impact. The reasonably foreseeable future actions would not impact other historic structures.

Conclusion

The No Action Alternative would result in negligible impacts to historic structures as no construction activities would take place. Therefore, this alternative would not contribute to any cumulative disturbance of historic structures when considered with any past, present, or reasonably foreseeable future actions. Considering these negligible effects, this alternative would not impair historic structures. Implementation of this alternative would not result in any unacceptable impacts and is consistent with *NPS Management Policies 2006*.

Impacts of Alternative B (Preferred Alternative)

Impacts Analysis

The Preferred Alternative would result in minor adverse effects to the Mission 66 structures and features at Panther Junction and Rio Grande Village. The new facilities in Panther Junction are not accessible to Park visitors and are sufficiently distant that they would visually merge into the existing array of structures already in place in the administrative areas of Panther Junction and the visual effect would be negligible. Although the proposed new U.S. Border Patrol housing and the proposed Big Bend Natural History Association duplex are adjacent to part of the original Mission 66 era roadbed, there will be no physical or visual effect on that road. The proposed housing complex for NPS and concession staff as well as the duplex proposed for the Big Bend Natural History Association may be within the viewshed of Mission 66 era employee housing. Because the NPS will consider compatible architectural design that will not detract from the values of the Mission 66 properties, this alternative will have no adverse effect on the Mission 66 properties. Since no historic resources have been identified at the Castolon location, there would be no impacts to historic resources at this location.

Cumulative Effects

As described under Alternative A, a new visitor center will be constructed at Panther Junction and other administrative, maintenance, and storage facilities are proposed for other areas of the Park, including Rio Grande Village, in the Park's GMP. However, that plan notes that prior to such actions, the present Mission 66 visitor center would be evaluated for the NRHP. If determined eligible, any changes to the building would be done in such a manner as to not impact the character-defining features. If the Mission 66 visitor center is determined eligible and a new visitor center is constructed, the new visitor center would have a minor beneficial effect on the extant structure because of the daily wear on a visitor center designed for fewer visitors than are currently received. Elsewhere in the Park where other Mission 66 properties are located, new facilities that are planned would be done in such a manner as to not impact the character-defining features of those properties. Thus, cumulatively these activities will have an overall minor beneficial effect on historic structures when considered with other past, present, and reasonably foreseeable future actions.

Conclusion

The Preferred Alternative would result in minor adverse impacts to Mission 66 properties at Panther Junction and Rio Grande Village. The new construction at Panther Junction and Rio Grande Village may be within the viewshed of the employee housing constructed as part of the Mission 66 program.

Implementation of this alternative would not result in any unacceptable impacts and is consistent with *NPS Management Policies 2006*.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5, Assessment of Adverse Effects), the NPS concludes that the implementation of the Preferred Alternative will have no adverse effect on the Mission 66 properties at Panther Junction and Rio Grande Village.

Archeological Resources

Intensity Level Definitions

Archeological resources are the tangible remains of human occupations that are no longer in use. The only eligible archeological site in the APE of the proposed activities is site 41BS611, a site within the footprint of the proposed law enforcement complex and the proposed storage building for Science and Resource management staff and equipment at Panther Junction. The methodology used for assessing impacts to these cultural resources is based on how the project will affect features for which the site may be significant. The thresholds for this impact assessment are the same as those used for Historic Structures above.

Impacts of Alternative A (No Action)

Impacts Analysis

The No Action alternative would result in negligible impacts to site 41BS611 in Panther Junction, Rio Grande Village, and at Castolon because the NPS would not undertake construction of new facilities.

Cumulative Effects

In the future, other administrative, maintenance, and storage facilities are proposed in the Park's GMP. Because Panther Junction is the main administrative center in the Park, it is likely that some of those facilities would be placed in Panther Junction. These actions could result in impacts to site 41BS611. However, development would be designed to avoid this site, where possible. If it could not be avoided, the site would be mitigated through data recovery in accordance with the *Secretary of Interior's Standards and Guidelines for Archeology and Historic Preservation* and other archeological technical guidance. Thus, the negligible impact of this alternative, together with the moderate adverse impacts of other reasonably foreseeable future actions would result in negligible to minor adverse effects on this site.

Conclusion

The No Action Alternative would result in negligible impacts to site 41BS611 as no construction activities would take place. Therefore, this alternative would not contribute to any cumulative disturbance of archeological resources when considered with any past, present, or reasonably foreseeable future actions. Considering these negligible effects, this alternative would not affect site 41BS611. Implementation of this alternative would not result in any unacceptable impacts and is consistent with *NPS Management Policies 2006*.

Impacts of Alternative B (Preferred Alternative)

Impacts Analysis

The Preferred Alternative would result in moderate adverse effects to site 41BS611 at Panther Junction. The proposed new law enforcement center would be constructed on this site as will the

storage building for Science and Resource Management staff and equipment. The burial of utility lines will also impact portions of the site. To mitigate this adverse effect, the Park notified the SHPO of the Proposed Action in September 2007. The notification included a MOA, an agreement document that details how adverse effects of the activities in Panther Junction on NRHP site 41BS611 would be mitigated. The mitigation measures consist of mapping and excavation of the hearths, middens, and other features on the site that will be impacted by the proposed law enforcement complex, proposed storage building, and burial of nearby utility lines. The SHPO has not yet responded, but it is anticipated that they will concur with the proposed MOA. Their response will be received and any comments considered before the Park reaches a final decision on the Proposed Action.

Cumulative Effects

As described under Alternative A, new facilities are proposed for other areas of the Park, including Panther Junction, in the Park's GMP. Some of those planned facilities may impact site 41BS611. As well, sites at the National Park are subject to damage from vandalism and looting. However, this impact would be negligible at site 41BS611 as the site is routinely monitored by the Park Archeologist who resides at the Panther Junction complex and has his office based there. If the site could not be avoided by new construction, it would be mitigated through data recovery. Thus, cumulatively these activities will have an overall moderate adverse effect on eligible sites when considered with other past, present, and reasonably foreseeable future actions. Thus, the moderate adverse effect of this alternative, together with moderate adverse impacts of other reasonably foreseeable future actions would result in a moderate adverse effect on this site.

Conclusion

The Preferred Alternative would result in moderate adverse impacts to site 41BS611 in Panther Junction. The new construction for a law enforcement center, proposed storage building, and burial of utilities would impact this site. Implementation of this alternative would not result in any unacceptable impacts and is consistent with NPS *Management Policies 2006*.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5, Assessment of Adverse Effects), the NPS concludes that the implementation of the Preferred Alternative would have an adverse effect on site 41BS611. To mitigate the adverse effect, the NPS has submitted a MOA to the SHPO. The MOA outlines a program to conduct archeological investigations in the areas of the site that would be impacted.

Ethnographic Resources

As defined in DO-28, ethnographic resources may be 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." Seven tribes are believed to be affiliated with the Park – Apache Tribe of Oklahoma, Blackfeet Tribe, Comanche Tribe of Oklahoma, Kickapoo Traditional Tribe of Texas, Kiowa Tribe of Oklahoma, Mescalero Apache Tribe, and Ysleta Del Sur Pueblo. These tribes were notified of the Proposed Action in a letter dated June 14, 2007. The Comanche Tribe of Oklahoma responded that they had no concerns at the present time but requested a copy of this environmental assessment. The Ysleta del Sur Pueblo stated that the project is unlikely to adversely affect sites of traditional, religious, or cultural significance to their pueblo. The remaining tribes did not respond (see the Consultation and Coordination section of this document). No ethnographic resources are present in the APE of any of the three project areas.

Cultural Landscapes

Intensity Level Definitions

DO-28 states that 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.” A cultural landscape comprises all cultural and natural resources associated with a historic event, activity, or person or exhibiting other cultural or aesthetic values within a given geographic area. Cultural landscapes are the result of the interaction between humans and the natural landscape. Rio Grande Village has been inventoried by the NPS as a Mission 66-era cultural landscape. Although this landscape has not yet achieved 50 years of age and has not been evaluated for listing in the NRHP, NPS Intermountain Region has stipulated that activities that may affect Mission 66 structures are subject to the provisions of Section 106 until they are evaluated for the NRHP. The methodology used for assessing impacts to these cultural resources is based on how the project will affect features for which the structures may be significant. The thresholds for this impact assessment are the same as those for Historic Structures above.

Impacts of Alternative A (No Action)

Impacts Analysis

The No Action alternative would result in negligible impacts to the Mission 66-related cultural landscape in Rio Grande Village because the NPS would not undertake construction of new facilities.

Cumulative Effects

In the future, new facilities are proposed in the Park’s GMP for several areas of the Park, including Rio Grande Village. However, that plan notes that prior to such actions, the Mission 66 properties would be subjected to the requirements of Section 106. If an adverse effect is identified for one or more of those planned projects, the new facilities would be done in such a manner as to not impact the character-defining features of the Mission 66 properties. Thus, the negligible impact of this Alternative combined with past, present, and reasonably foreseeable future actions would result in negligible to minor adverse effects to the Rio Grande Village cultural landscape.

Conclusion

The No Action Alternative would result in negligible impacts to the cultural landscape as no construction activities would take place. Therefore, this alternative would not contribute to any cumulative disturbance of cultural landscapes when considered with any past, present, or reasonably foreseeable future actions. Considering these negligible effects, this alternative would not impair the Rio Grande Village cultural landscape. Implementation of this alternative would not result in any unacceptable impacts and is consistent with NPS *Management Policies 2006*.

Impacts of Alternative B (Preferred Alternative)

Impacts Analysis

The Preferred Alternative would result in minor adverse effects to the Mission 66 cultural landscape at Rio Grande Village. The proposed housing complex for NPS and concession staff will be within the viewshed of Mission 66 era employee housing that makes up part of the cultural landscape. However, the new housing units are not accessible to Park visitors. Moreover, the NPS will consider compatible architectural design that will not detract from the values of the Mission 66 properties. Therefore, this alternative will have a minor adverse effect on the Mission 66 properties.

Cumulative Effects

As described under Alternative A, new facilities are proposed for the Park, including at Rio Grande Village, in the Park's GMP. However, that plan notes that NPS Intermountain Region requires that activities that may affect Mission 66 properties are subject to the provisions of Section 106 until they are evaluated for the NRHP. If determined eligible, any adverse effects would be mitigated through the *Secretary of the Interior's Standards and Guidelines for Archeology and Historic Preservation* and 36 CFR 800. New facilities that are planned in Rio Grande Village would be done in such a manner as to not impact the character-defining features of those properties. Thus, cumulatively these activities will have an overall minor adverse effect on the cultural landscape when considered with other past, present, and reasonably foreseeable future actions.

Conclusion

The Preferred Alternative would result in minor adverse impacts to Mission 66 cultural landscape in Rio Grande Village. The new construction at Rio Grande Village may be within the viewshed of the employee housing constructed as part of the Mission 66 program. Implementation of this alternative would not result in any unacceptable impacts and is consistent with *NPS Management Policies 2006*.

Section 106 Summary

After applying the Advisory Council on Historic Preservation's criteria of adverse effect (36 CFR 800.5, *Assessment of Adverse Effects*), the NPS concludes that the implementation of the Preferred Alternative would have no adverse effect on the Mission 66 properties at Rio Grande Village.

Lightscape Management

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

The NPS's Night Sky Team visited the Park in November 2005 and, using special camera equipment, took panoramic photos from a desert location and from the top of Emory Peak. Based on similar data collected from a number of western national parks, the team estimates that Big Bend ranks around third in terms of national parks with the darkest skies. The protected night sky offers unique opportunities for its enjoyment and for studies of both amateur and professional astronomers. Brewster County (2001) has passed an outdoor lighting ordinance to protect the night sky for the Park.

Methodology

Intensity Level Definitions

The methodology used to assess potential changes to lightscape management are defined as follows:

- Negligible: The lightscape would not be affected or changes in the lightscape would likely be below or at the lower levels of detection. Any effects would be short-term.
- Minor: Changes to the natural lightscape would be detectable, although the changes would be slight and likely short-term. Mitigation may be needed to offset adverse effects and would be relatively simple to implement and likely be successful.

- Moderate:** Changes to the natural lightscape would be readily apparent and would result in a change to the lightscape of a relatively wide area. Mitigation measures would be necessary to offset adverse effects and would likely be successful.
- Major:** Changes to the lightscape would be readily apparent and would substantially change the character of the lightscape over a large area in and out of the project area. Mitigation measures to offset adverse effects would be needed, extensive, and their success could not be guaranteed.

Impacts of Alternative A (No Action)

Impacts Analysis

No facilities would be constructed under this alternative; therefore the lightscape within the project area would not be impacted, and current conditions would remain the same.

Cumulative Effects

Although other past, present, and reasonably foreseeable future actions may affect the lightscape in the area, Alternative A would have no impacts and therefore would not contribute to the effects of other actions.

Conclusion

Alternative A would have no impacts on the lightscape as conditions would remain the same. Because there would be no impacts to resources or values whose conservation are (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 GMP or other relevant NPS planning documents, there would be no impairment of the Park's lightscape or values under Alternative A. Implementation of this alternative would not result in any unacceptable impacts and is consistent with NPS *Management Policies 2006*.

Impacts of Alternative B (Preferred Alternative)

Impacts Analysis

The NPS would preserve, to the greatest extent possible, the natural lightscape the Park, which is a natural resource and value that exist in the absence of human-caused light by:

- Restricting the use of artificial lighting in parks to those areas where security, basic human safety, and specific cultural resources requirements must be met;
- Using minimal-impact lighting techniques;
- Shielding artificial lighting where necessary to prevent light intrusion upon viewsheds and degradation of night sky visibility, physiological processes of living organisms, and similar natural processes.

The Preferred Alternative would incorporate exterior lighting on the housing and law enforcement complex. As mentioned above, the lighting would be directed downward toward the intended subject with appropriate shielding mechanisms, and would only be placed in areas where lighting is needed for safety reasons. Direct impacts to the lightscape related to the proposed project would be long-term, moderate, localized and adverse under this alternative.

No construction activities would continue after dark; therefore no artificial lighting would be necessary. Consequently, there would be negligible impacts to the lightscape as a result of

construction activities. Implementation of this alternative would not result in any unacceptable impacts and is consistent with NPS *Management Policies 2006*.

Cumulative Effects

Cumulative impacts to the lightscape could occur from any past, present, and reasonably foreseeable future activities. Exterior lighting would be incorporated as necessary on the new facilities which are proposed and currently under construction. The lightscape preservation techniques mentioned above would be incorporated in these projects as practicable.

Overall, the cumulative effects of past, present, and foreseeable future projects on the natural lightscape would be minor, localized, and adverse over the long-term. Alternative B would contribute to long-term adverse impacts to the natural lightscape within the immediate project area; however the contribution would be minor overall and would not change the intensity of cumulative effects.

Conclusion

Permanent lighting would be added to the housing and law enforcement complex proposed under Alternative B, which would result in long-term, negligible, localized and adverse direct impacts to the natural lightscape. These impacts would be significantly minimized by incorporating the natural lightscape preservation techniques mentioned above.

Cumulative impacts on the lightscape from Alternative B; in conjunction with other past, present, and future activities; would be minor, localized, and adverse over the long-term. Because there would be no impacts to resources or values whose conservation are (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 GMP or other relevant NPS planning documents, there would be no impairment of the Park's lightscape resources or values under Alternative B.

Park Operations

Methodology

Intensity Level Definitions

Implementation of a project can effect the operations of the Park such as the numbers of employees needed; the type of duties that need to be conducted; when/who would conduct these duties; how activities should be conducted; and administrative procedures. For the purpose of this analysis, the human health and safety of the Park employees is also evaluated. The methodology used to assess potential changes to Park operations are defined as follows:

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

Major: The effects would be readily apparent and would result in a substantial adverse or beneficial change in Park operations in a manner noticeable to staff and the public, and be markedly different from existing operations. Mitigation measures to offset adverse effects would be needed, could be expensive, and their success could not be guaranteed.

Impacts of Alternative A (No Action)

Impacts Analysis

The No Action Alternative would not measurably change current operations at the Big Bend National Park. The existing headquarter facilities at Panther Junction would continue to be overcrowded with administrative and operations staff. There would continue to be substandard and inadequate housing for current and future Park and U.S. Border Patrol employees.

Cumulative Effects

Any project that occurs in the Park has an effect on operations; therefore, most of the actions listed in the cumulative scenario in the introduction of this chapter would have some degree of effect on employees and Park operations. Planning for improvements, replacement or new facilities mentioned above would typically involve the majority of the Park staff to contribute their expertise and assistance. Resource management such as the wetland restoration project would primarily involve the resources staff. Under Alternative A, Park operations associated with the current and future use of the existing headquarters facility and housing are not expected to change; therefore operations would not appreciably change when considered with other past, present, and reasonably foreseeable future actions.

Conclusion

The No Action Alternative would not measurably change current Park operations because the existing headquarters facility and staff housing would continue to function as such. The impact; however, of overcrowded operations and administrative facilities coupled with substandard and inadequate staff housing would have a minor to moderate adverse effect on Park operations and employees. Cumulatively, these effects would have a negligible impact to Park operations when considered with other past, present, and reasonably foreseeable future actions. Implementation of this alternative would not result in any unacceptable impacts and is consistent with *NPS Management Policies 2006*.

Impacts of Alternative B (Preferred Alternative)

Impacts Analysis

Impacts to park operations from the Preferred Alternative are generally positive. Since the intent of the project is to replace substandard housing, construct new housing, improve storage facilities and increase office space, these objectives would directly and indirectly improve operations at the Park. Replacement of existing substandard housing would improve the living conditions of current staff located in those structures. Subsequent benefits would be expected to include improved job satisfaction, better morale and longer retention of staff. All of these improvements would contribute to improved day-to-day operations in the Park. Construction of new housing would provide accommodations for additional NPS staff, U.S. Border Patrol personnel, and concessionaire staff. These additional personnel are needed to continue to provide maintenance, management and concessionaire services in the Park, and in the case of the U.S. Border Patrol, meet increasing staffing needs along the U.S./Mexico border. The construction of new office space, storage facilities and parking areas would improve the functional efficiency of day-to-day operations in the Park.

Cumulative Effects

As described in Alternative A, any project that occurs in the Park has an effect on operations; therefore, most of the actions listed in the cumulative scenario in the introduction of this chapter would have some degree of effect on employees and operations. Planning for improvements, replacement or new facilities mentioned above would typically involve the majority of the Park staff to contribute their expertise and assistance. Resource management such as the wetland restoration project would primarily involve the resources staff. Park operations associated with the current and future use of the existing headquarters facility and housing would be improved to a moderate degree, which would cumulatively have a minor beneficial impact to operations when considered with other past, present, and reasonably foreseeable future actions.

Conclusion

New construction under the Preferred Alternative would have a minor to moderate benefit on Park operations because the new law enforcement complex and staff housing would provide a less crowded working and living environment. Cumulatively, the improvements associated with this alternative would have a minor beneficial effect on Park operations when considered with other past, present, and reasonably foreseeable future actions. Implementation of this alternative would not result in any unacceptable impacts and is consistent with NPS *Management Policies 2006*.

Special Status Species

This impact analysis identified federally listed and candidate species that could be affected by project implementation and analyzed impacts on those affected species. A list of federally threatened, endangered, and candidate species for Brewster County, Texas was downloaded from the USFWS, Southwest Region's website (USFWS 2007). This list was compared with the Park's list of federally listed species known to occur within the Park. The project area was compared with known listed and sensitive species distribution records and habitat types in order to assess potential impacts.

The Big Bend gambusia (*Gambusia gaigei*) is the only federally listed species that could be affected by the proposed projects. This fish lives in spring-fed marshes with dense vegetation, primarily Chara and cat-tail. Its habitat is clear, shallow water fed by warm springs. The Big Bend gambusia is located in the wild at only one area – near Rio Grande Village in the Park. Two warm springs (Spring 1 and Spring 4) near Rio Grande Village feed several ponds that provide habitat for the entire wild population of Big Bend gambusia. There is a small population being maintained at the USFWS fish hatchery in Dexter, New Mexico. The Big Bend gambusia is threatened by habitat alteration, groundwater pumping, declining spring flows and competition with introduced nonnative species such as the *Gambusia affinis*. A recovery plan was prepared for the Big Bend gambusia by the USFWS in 1984.

Methodology

Intensity Level Definitions

The thresholds of change for the intensity of an impact to threatened, endangered, and sensitive species are defined as follows:

Negligible: An action that would not affect any individuals of a listed or sensitive species or their habitat within the Park. No federally listed species would be affected; or the alternative would affect an individual of a listed species or its critical habitat, but the change would be so small that it would not be of any measurable or perceptible consequence to the protected individual or its population. Any impact would be site-

specific. A negligible effect would equate with a “no effect” determination in USFWS terms.

- Minor:** An action that would affect a few individuals of sensitive species or have highly localized impacts upon their habitat within the Park. The change would require considerable scientific effort to measure and have barely perceptible consequences to the species or habitat function. The alternative would affect an individual(s) of a listed species or its critical habitat, but the change would be small. A minor effect would equate with a “may effect” determination in USFWS terms, and would be accomplished by a statement of “not likely to adversely affect” the species.
- Moderate:** An action that would cause measurable effects on: (1) a relatively moderate number of individuals within a sensitive species population, (2) the existing dynamics among multiple species (e.g., predator-prey, herbivore-forage, vegetation structure-wildlife breeding habitat), or (3) a relatively large habitat area or important habitat attributes within the Park. A sensitive species population or habitat might deviate from normal levels under existing conditions, but would remain indefinitely viable within the Park. An individual or population of a listed species or its critical habitat would be noticeably affected. The effect could have some consequence to the individual, population, or habitat. Mortality or interference with activities necessary for survival are expected on an occasional basis, but are not expected to threaten the continued existence of the listed species in the Park. A moderate effect would equate with a “may effect” determination in USFWS terms and would be accompanied by statement of “not likely to adversely affect” the species. State species of concern could also be affected.
- Major:** An action that would have drastic and permanent consequences for a sensitive species population, dynamics among multiple species, or almost all available critical or unique habitat area within the Park. A sensitive species population or its habitat would be permanently altered from normal levels under existing conditions, and the species would be at risk of extirpation from the Park. An individual or population of a listed species, or its critical habitat, would be noticeably affected with a vital consequence to the individual, population, or habitat. Mortality or other effects are expected on a regular basis and could threaten continued survival of the species in the Park. A major effect would equate with a “likely to adversely affect” determination in USFWS terms. A “take” under Section 7 of the Endangered Species Act could occur.

Impacts of Alternative A (No Action)

Impacts Analysis

No facilities would be constructed under this alternative; therefore, the Big Bend gambusia would not be impacted, and current conditions would remain the same.

Cumulative Effects

Cumulative impacts to the threatened, endangered, candidate, and sensitive species could occur from any past, present, and reasonably foreseeable future activities. Past and present projects affecting the Big Bend gambusia have included park operations, a new (under construction) domestic water system, pond construction and wetland restoration. Park operations and developments within the Rio Grande Village developed area are causing habitat contamination, diminished hydrologic flows to wetland/riparian habitat, and other potential threats to the Big Bend gambusia habitat. Development of the Rio Grande Village campground and subsequent increases in visitors and employees to the area have increased human demand for the spring water used by the Big Bend gambusia. This increasing demand has had and is having an adverse impact on the species and its habitat. Historically, water for

domestic use at Rio Grande Village has been pumped from a containment box at the head of Spring 4. A new water system project, currently under construction, will create a new source for domestic water use for the Rio Grande Village developed area, and is expected to alleviate demands on Spring 4. A pond was recently constructed that uses Spring 4 as a water source to provide additional habitat to the Big Bend gambusia. Recent wetland restoration projects have removed some development from inside the wetland perimeter.

Future projects that could affect threatened, endangered, and sensitive species in the project area include additional wetland restoration, campsite relocation, and expansion of the RV hookup area. Campground relocation would benefit the gambusia over the long term by reducing habitat contamination and would be consistent with the *Big Bend Gambusia Recovery Plan*.

Although other past, present, and reasonably foreseeable future actions may affect the gambusia, the no action alternative would have no impacts on the gambusia and therefore would not contribute to the effects of other actions. Overall, the cumulative effects on threatened, endangered, candidate, and sensitive species from Alternative A, in conjunction with other past, present, and future activities, would be long-term, localized, minor and both beneficial and adverse.

Conclusion

Alternative A would have no direct or indirect impacts on endangered, threatened, candidate, and sensitive species as conditions would remain the same. Cumulative effects would be long-term, localized, negligible to minor and both beneficial and adverse. Because there would be no impacts to resources or values whose conservation are (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 GMP or other relevant NPS planning documents, there would be no impairment on threatened, endangered, candidate, and sensitive species or values under the No Action Alternative. Implementation of this alternative would not result in any unacceptable impacts and is consistent with *NPS Management Policies 2006*.

Impacts of Alternative B (Preferred Alternative)

Impacts Analysis

The construction of three new houses and three new RV hook-up sites at the Rio Grande Village employee housing area could potentially increase the demand on groundwater and subsequently affect spring flows to wetland/riparian habitat. No construction activities would occur within or near the ponds occupied by the Big Bend gambusia. The mitigation measures mentioned above in the Water Resources section would be employed to prevent any decreased water quality or contamination of the gambusia habitat. Following the conservation and recovery objectives set forth in the *Big Bend Gambusia Recovery Plan* a new drinking water system is under construction in Rio Grande Village.

The new drinking water system will move the Rio Grande Village domestic water supply source from the spring head at Spring 4 to a new well approximately three-quarters of a mile northeast of Springs 1 and 4. The production zone of the well is in a different fault/fracture zone than that of the springs and is at a considerably greater depth (Cross 1984). Pump testing and monitoring of the new well occurred during the planning stages of the project to evaluate whether the conversion of the domestic water supply to the well would affect water levels in Springs 1 or 4 or the surrounding aquifer. While the pump test results were not definitive, they indicated the new water supply well should be able to sustain a long-term yield of 15 gpm, which would meet current and future public water needs at Rio Grande Village, without affecting aquifer levels at Springs 1 or 4 (NPS 2006a). To more comprehensively determine whether use of the new well affects Springs 1 or 4, the NPS committed to monitoring the aquifer, spring head levels, and the endangered fish pond system (Wellman 2007).

Additionally, a commitment was made between the NPS and USFWS that the overall domestic water use at Rio Grande Village would remain within the range of variability experienced within recent years (Wellman 2007, Pine 2007). The construction and use of three new houses and three new RV hook-up sites at the Rio Grande Village employee housing area could potentially increase the demand on groundwater and subsequently affect spring flows to wetland/riparian habitat. However, system improvements, including increased efficiency and leak reduction are expected to keep domestic use within the historical range of variability. Finally, if water use monitoring indicates the potential to exceed the historical range, water use reduction would be made through system efficiencies and/or reductions in consumption.

Cumulative Effects

Cumulative impacts to the Big Bend gambusia could occur from any past, present, and reasonably foreseeable future activities. Past and present projects affecting the Big Bend gambusia have included park operations, new water system, pond construction and wetland restoration. Park operations and developments within Rio Grande Village developed area are causing habitat contamination, diminished hydrologic flows to wetland/riparian habitat, and other potential threats to the Big Bend gambusia habitat. Development of the Rio Grande Village campground and subsequent increases in visitors and employees to the area have increased human demand for the spring water used by the Big Bend gambusia. This increasing demand has had and is having an adverse impact on the species and its habitat. Historically, water for domestic use at Rio Grande Village has been pumped from a containment box at the head of Spring 4. As mentioned above, a new water system project, currently under construction, will create a new source for domestic water use for the Rio Grande Village developed area, and is expected to alleviate demands on Spring 4. A pond was recently constructed that uses Spring 4 as a water source to supply additional habitat to the Big Bend gambusia. Recent wetland restoration projects have removed some development from inside the wetland perimeter.

Future projects that could affect the Big Bend gambusia include additional wetland restoration, campsite relocation, and expansion of the RV hookup area. Campground relocation away from the ponds which currently provide habitat would benefit the gambusia over the long term by reducing habitat contamination and would be consistent with the *Big Bend Gambusia Recovery Plan*.

Overall, the cumulative effects on Big Bend gambusia from Alternative B, in conjunction with other past, present, and future activities, would be long-term, localized, minor and both beneficial and adverse.

Conclusion

Construction of the proposed facilities at Rio Grande Village would result in negligible to minor, localized, and adverse impacts on the Big Bend gambusia and its habitat in the long-term. Cumulative impacts on the gambusia from Alternative B; in conjunction with these other past, present, and future activities; would be localized, minor, and both beneficial and adverse over the long term. Because there would be no impacts to resources or values whose conservation are (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 GMP or other relevant NPS planning documents, there would be no impairment of the Park's threatened, endangered, candidate, or sensitive species resources or values under Alternative B. Implementation of this alternative would not result in any unacceptable impacts and is consistent with *NPS Management Policies 2006*.

CONSULTATION AND COORDINATION

Scoping

External Scoping

External scoping was initiated with the distribution of a scoping letter to inform the public of the proposed trail realignment, and to generate input relevant to the preparation of this EA. The scoping letter dated June 14, 2007 was mailed to 79 state and federal agencies, special interest groups, and individuals (see Appendix A). In addition, the scoping letter was mailed to the Park's seven affiliated Native American tribes. Scoping information was also posted on the Park's website. During the 30-day scoping period, three responses were received. The responses received did not indicate any immediate concerns. The first respondent expressed positive support for the project. One respondent requested a copy of the EA and copies of any reports created for the project. Two respondents requested to be contacted should human remains be discovered during the project work. A fourth response was received after the 30-day scoping period and provided comments on dust and particulate emissions and recommended that action should be taken to prevent surface and groundwater contamination but did not indicate any immediate concerns. Copies received of any response letters from state, federal, and international agencies follow. Other responses are on file in the Park's Science and Resource Division compliance files.

Internal Scoping

Internal scoping was conducted with an interdisciplinary team of environmental professionals from Big Bend National Park. Project information needed to begin internal scoping was entered into the PEPC online system in August 2007. Interdisciplinary team members were provided details of the Proposed Action in several informal meetings and during a site visit in September 2007. Additionally, interdisciplinary team members met on August 6, 2007 to discuss the purpose and need for the project; various alternatives; potential environmental impacts; past, present, and reasonably foreseeable projects that may have cumulative effects; and to develop mitigation measures. Prior to the August 2007 interdisciplinary team meeting, data needed to identify potential impacts to resources had been obtained during site visits to the proposed project area by interdisciplinary team members and other technical experts.

Environmental Assessment Review

The EA will be released for public review in August 2008. To inform the public of the availability of the EA, the NPS will publish and distribute a letter or press release to various agencies, tribes, and members of the public on the Park's mailing list, as well as place an ad in the local newspaper. Copies of the Environmental Assessment will be provided to interested individuals, upon request. Copies of the document will also be available for review at the Park's visitor center and on the internet at <http://parkplanning.nps.gov/>. The EA is subject to a 30-day public comment period ending September 13, 2008. During this time, the public is encouraged to submit their written comments to the NPS address provided at the beginning of this document. Following the close of the comment period, all public comments will be reviewed and analyzed, prior to the release of a decision document. The NPS will issue responses to substantive comments received during the public comment period, and will make appropriate changes to the EA, as needed.

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- U.S. Federal Emergency Agency (FEMA).
1985 Flood Insurance Rate Map. Brewster County, Texas, Unincorporated Area. Community Panel Number 480084 1525 B.

U.S. Federal Emergency Agency (FEMA).

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1985 *Soil Survey of Big Bend National Park, Part of Brewster County, Texas*. By Rex A. Cochran and Jerry L. Rives.

Wellman, William E.

2007 Correspondence [January 12, 2007 letter to Robert Pine, Office Supervisor, USFWS, Austin, TX] Superintendent. Big Bend National Park.

APPENDIX A Public Scoping Letter & List of People and Agencies/Organizations to whom the Scoping Letters Were Sent



United States Department of the Interior
NATIONAL PARK SERVICE
BIG BEND NATIONAL PARK
RIO GRANDE WILD AND SCENIC RIVER
P.O. Box 129
Big Bend National Park, Texas 79834-0129



L7619 (7137)

June 14, 2007

Dear Interested Party:

The National Park Service is proposing to develop an Environmental Assessment (EA) to implement development within the areas identified in the 2004 General Management Plan for facilities to support park operations at Panther Junction, Rio Grande Village and Castolon. Facilities will include various housing units, including two and three bedroom houses, multiplexes units, apartments and dorms, for National Park Service, concessionaire and Border Patrol employees living and working in Big Bend National Park. Other facilities would include NPS Ranger/Border Patrol offices and associated facilities such as boat storage, parking, etc.

Under the Preferred Alternative, new housing units inside the park would be located in Rio Grande Village, Castolon, and Persimmon Gap if water sources can be found. Also, the National Park Service could build additional housing units in Panther Junction to accommodate NPS needs as well as the needs of the Border Patrol and the concessionaire. The majority of this housing will replace outdated trailer housing currently existing in the park. A total of eight new housing units would be constructed to provide for better resource protection and visitor safety, and interpretation. Fire bays would be built at Rio Grande Village and Castolon to achieve greater resource protection.

An EA will be prepared to analyze the proposal and alternatives and their impacts on the environment. This EA will be prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and regulations of the Council on Environmental Quality (40 CFR 1508.9).

Big Bend National Park invites comments from interested agencies and public. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. Written comments can be sent to: Superintendent, P.O. Box 129, Big Bend National Park, Texas 79834 or you can access our website and make comments at: <http://parkplanning.nps.gov>. The 30-day scoping comment period starts on June 14, 2007 and ends on July 14, 2007.

Thank you for your interest in Big Bend National Park.

Sincerely,

William E. Wellman
Superintendent

National Park Service
U.S. Department of the Interior



Big Bend National Park Proposed Environmental Assessment for Proposed Construction in Big Bend National Park

Date: June 14, 2007

Contact: Vidal Davila, 432-477-1143

Big Bend National Park is proposing to develop an Environmental Assessment (EA) covering the areas of development identified in the 2004 General Management Plan for facilities supporting park operations at Panther Junction, Rio Grande Village, and Castolon. Facilities will include various housing units, including two and three bedroom houses, multiplexes units, apartments and dorms, for National Park Service, concessionaire, and Border Patrol employees living and working in Big Bend National Park. Other facilities would include NPS Ranger and Border Patrol offices and associated facilities such as boat storage, parking, etc.

The EA will be prepared in accordance with the National Environmental Policy Act (NEPA) of 1969 and regulations of the Council on Environmental Quality (40 CFR 1508.9), and will analyze a reasonable range of alternatives and their impact on the environment.

Big Bend National Park invites comments from interested agencies and public. Please access our website and **make comments**. Written comments can be sent to: Superintendent, P.O. Box 129, Big Bend National Park, Texas, 79834. Before including your address, phone number, e-mail address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information – may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so. The 30-day scoping comment period starts on June 14, 2007 and ends on July 14, 2007.



Did You Know?

The Harte Ranch section of the North Rosillos Mountains was added to Big Bend National Park in 1987. Property owners Houston H. Harte and Edward H. Harte donated the 67,000 acre ranch to the Texas Nature Conservancy in 1985 with the understanding that it would eventually become part of the park.

Last Updated: June 15, 2007 at 14:52 EST

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Boxholder
Terlingua, TX 79852

Mike Long
Desert Sports
Boxholder
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Greg Hennington
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Fred Armstrong
Guadalupe Mountains National Park
HC 60, Box 400
Salt Flat, TX 79847-9400

John Lujan
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Chuck Hunt
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Alan Cox
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Reb Gregg, President
Friends of Big Bend National Park
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Houston, TX 77002

Texas Commission on Environmental Quality
P.O. Box 13087
Austin, TX 78711

Mr. David Allen
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El Paso, TX 79901

Commissioner
International Boundary & Water Comm.
The Commons Bldg, Suite 31
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El Paso, TX 79902

Mr. Roy Coffee III
Texas Office of State/Federal Regulations
201 East 14th Street, Suite 507
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Mr. Mike Hill
Region 1 State Parks Director
Texas Parks and Wildlife Dept.
POB 1079
Fort Davis, TX 79734

Mr. Jack Davis
Texas Water Commission
P.O. Box 13087
Austin, TX 78711

Mr. Tyrus Fain
P.O. Box 183
Marathon, TX 79842

Commissioner
Rio Grande Compact Commission
P.O. Box 1917
El Paso, TX 79950-1917

Judge Leo Smith
Terrell County Courthouse
105 East Hackberry
Sanderson, TX 79848

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Texas Parks and Wildlife Dept.
Endangered Resources Branch
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Ms. Maurie Haas
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Weslaco, TX 78596

The Nature Conservancy
Trans Pecos Office
109 N State St
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Mr. John Karges
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Fort Davis, TX 79736

Sierra Club
Lone Star Chapter
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Austin, TX 78767

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Division of Resource Protection
Texas Parks and Wildlife Dept.
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Austin, TX 78744

Dr. Andrew Price
Texas Parks and Wildlife Dept.
Division of Resource Protection
4200 Smith School Road
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Regional Administrator
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Ms. Patty Manning
Sul Ross State University
Dept of Biology
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Luis Armendariz
Park Manager
Texas Parks & Wildlife
Big Bend Ranch State Park
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Presidio, TX 79845

Mr. F. Lawrence Oaks, Executive Director
State Historical Preservation Officer
Texas Historical Commission
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Ms. Debra Little
International Boundary Water Commission
United States Section
4171 North Mesa, Suite C310
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Fran Sage
Big Bend Regional Sierra Club
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Amy Sugeno
Resource Management Division
Texas Parks and Wildlife Dept.
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Austin, TX 78744

The Wilderness Society
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Washington, DC 20006

Kay Bailey Hutchison
282 Russell Senate Office Building
Washington, DC 20510-4304

Kay Bailey Hutchison
145 Duncan Drive, Suite 120
San Antonio, TX 78226-1898

Val Beard
Brewster County Judge
P.O. Drawer 1630
Alpine, TX 79831

Walt Dabney
Parks Division Director
Texas Parks & Wildlife Dept
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Austin, TX 78744-3292

Susan Combs, Commissioner
Texas Dept of Agriculture
P.O. Box 12847
Austin, TX 78711

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Alpine, TX 79830

Big Bend Chamber of Commerce
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Terlingua, TX 79852

Marfa Chamber of Commerce
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Marfa, TX 79843

Marathon Chamber of Commerce
P.O. Box 163
Marathon, TX 79842

Fort Stockton Chamber of Commerce
222 W. Dickinson
Fort Stockton, TX 79735

Sierra Club
Houston Regional Group
POB 3021
Houston, TX 77253-3021

Brandt Mannchen
Conservation Committee
Houston Sierra Club
5431 Carew
Houston, TX 77096

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Marathon, TX 79842

J.P. Bryan
Chalk Draw Ranch
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Marathon, TX 79842

Joe Lewis
Chalk Draw Ranch
101 W. Hwy 90
Marathon, TX 79842

Mike Pittman
Texas Parks & Wildlife Dept.
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Alpine, TX 79830

Dave Holdermann
Non-Game Biologist
Texas Parks & Wildlife Dept
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Alpine, TX 79830

Louis A. Harveson
Department of Range and Wildlife
Sul Ross State University
PO Box C-114
Alpine, TX 79832

Saidor Turman
USDA APHIS WS
POB 1521
Fort Stockton, TX 79735

Davis Mountains Trans-Pecos Heritage
Association
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101 E. Brown Avenue
Alpine, TX 79832

Pitcock Brothers
Pitcock Rosillos Mountains Ranch
P.O. Box 1747
Graham, TX 76450

Roy, Louis Jr., and Duff Pitcock
Pitcock Rosillos Mountains Ranch
P.O. Box 175
Big Bend National Park, TX 79834

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Sanderson, TX 79848

Texas Chapter Audubon Society
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Building II, Suite 410
Austin, TX 78746

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Lajitas the Ultimate Hideout
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Lajitas, TX 79852

Kathy Killingsworth
County Commissioner
PO Boxholder
Terlingua, TX 79852

Jim & Barbara Hines
HC 65
PO Box 255F
Alpine, TX 79830

Roland Wauer
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Victoria, TX 77905

Ken Kramer
Texas Chapter Sierra Club
PO Box 1931
Austin, TX 78767

Sam Richardson
PO Box 609
Terlingua, TX 79852

Dan Roe
Proyecto El Carmen
CEMEX Central S.A. de CV
Independencia 901-A
Monterrey, MX 64520

Bill and Bonnie McKinney
POB 20608
Del Rio, TX 78840

APACHE TRIBE OF OKLAHOMA
APACHE TRIBE OF OKLAHOMA BUSINESS
COMMITTEE
Alonzo Chalepah, Chairman
P.O. Box 1220
Anadarko, OK 73005

BLACKFEET
BLACKFEET TRIBAL BUSINESS COUNCIL
Jay Goddard, Chairman
P.O. Box 850
Browning, MT 59417

COMANCHE TRIBE OF OKLAHOMA
COMANCHE TRIBAL BUSINESS COMMITTEE
Wallace Coffey, Chairman
P.O. Box 908
Lawton, OK 73502

KICKAPOO TRADITIONAL TRIBE OF TEXAS
TRIBAL GOVERNMENT
Juan Garza, Jr., Chairman
HC 1 Box 9700
Eagle Pass, TX 78852

KIOWA TRIBE OF OKLAHOMA
KIOWA BUSINESS COMMITTEE
Sherman Chaddlesone, Tribal Administrator
P.O. Box 369
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MESCALERO APACHE TRIBE
MESCALERO TRIBAL COUNCIL
Sara Misquez, President
P.O. Box 227
Mescalero, NM 88340

YSLETA DEL SUR PUEBLO
TRIBAL GOVERNMENT
Arturo Sinclair, Governor
P.O. Box 17579
El Paso, TX 79907

TRIBAL HISTORIC PRESERVATION OFFICE
(THPO)
Holly Houghton, Interim THPO
MESCALERO TRIBAL COUNCIL
Sara Misquez, President
P.O. Box 227
Mescalero, NM 88340

TRIBAL CULTURAL RESOURCE
MANAGEMENT
Jacob Massoud, Environmental Director
(Compliance)
P.O. Box 17579
El Paso, TX 79907

APPENDIX B Agency/Organizations Comment Letters



COMANCHE TRIBE

NATIONAL PARK SERVICE
BIG BEND NP TX
NAGPRA
2007 AUG 13 AM 2 49

July 24, 2007

William Wellman, Superintendent
United States Department of the Interior
National Park Service
Big Bend National Park
Rio Grande Wild and Scenic River
PO box 129
Big Bend National Park, TX 79834-0129

Re: [L7619 (7137)] Proposed development of an Environmental Assessment (EA) to implement development within the areas identified in the 2004 General Management Plan for facilities to support park operations at Panther Junction, Rio Grand Village and Castolon

Dear Mr. Wellman:

Thank you for your letter of June 14th regarding the proposed development of an Environmental Assessment to substantiate a proposed construction project located at Panther Junction, Rio Grand Village, and Castolon.

At this time, the Comanche Nation has no immediate concerns or issues regarding this project; however, please keep us informed as your planning proceeds. When completed we would appreciate a copy of the Environmental Assessment being sent to us. Also we would like to receive any project reports, archaeological reports or other information that is derived from the planning, preparation, and construction work of this project.

If in the process of the project human remains or archaeological items are discovered, we request that you immediately cease the project work and notify us so that we may discuss appropriate disposition with you and the other Tribal Nations that may be affected by such discoveries.

We look forward to your reports as activities proceed.

Sincerely,

Ruth Toahty, NAGPRA Coordinator

P.O. Box 908 • Lawton, Oklahoma 73502 • PHONE: (580) 355-2250 • (580) FAX: 353-2270

Author Information

Keep Private: No
Name: Arturo Senclair
Organization: Ysleta del Sur Pueblo
Organization Type: I - Unaffiliated Individual
Address: P.O. Box 17579
El Paso, TX 79907
USA
E-mail: tribalcouncil@elp.r.com

Correspondence Information

Status: New **Park Correspondence Log:**
Date Sent: 07/12/2007 **Date Received:** 07/12/2007
Number of Signatures: 1 **Form Letter:** No
Contains Request(s): No **Type:** Web Form
Notes:

Correspondence Text

While we believe that this project will not adversely affect traditional, religious or culturally significant sites of our Pueblo and have no opposition to it, we would like to request consultation should any human remains and/or artifacts unearthed during this project be determined to fall under NAGPRA guidelines. Copies of our Pueblo's Cultural Affiliation Position Paper and Consultation Policy are available upon request.

Thank you for the opportunity to comment on this project.

COUNTY OF BREWSTER

Val Beard, County Judge

P.O. Drawer 1630 • Alpine, Texas 79831 • 432-837-2412 • Fax: 432-837-1127
email: val.beard@co.brewster.tx.us

NATL PARK SERVICE
BIG BEND NP TX

2007 JUN 21 PM 2 42

VB
6/21/07

June 20, 2007

Mr. William E. Wellman
Superintendent
Big Bend National Park
P.O. Box 129
Big Bend National Park, Texas 79834-0129

Re: June 14, 2007 Park Planning Letter

Dear Mr. Wellman

New housing units, various offices, and new facilities are desperately needed for Big Bend National Park. Since the majority of the proposed new housing, will replace dilapidated trailer housing, this should have no negative impact on the environment. In light of the above, this comment is in support of the Preferred Alternative which provides for better resource protection and visitor safety, while adding badly needed new facilities.

Respectfully,



Val Clark Beard

Buddy Garcia, *Chairman*
Larry R. Soward, *Commissioner*
Glenn Shankle, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Protecting Texas by Reducing and Preventing Pollution

September 17, 2007

Mr. William E. Wellman
Superintendent
U.S. Department of the Interior
Big Bend National Park
P. O. Box 129
Big Bend National Park, TX 79834-0129

Re: TCEQ Grant and Texas Review and Comment System (TRACS) #7758, Big Bend National
New Housing Units - Park-Rio Grande Village, Castolon, and Persimmon Gap

Dear Mr. Wellman:

The Texas Commission on Environmental Quality (TCEQ) has reviewed the above-referenced project and offers following comments:

A review of the project for General Conformity impact in accordance with 40 CFR Part 93 and Title 30, Texas Administrative Code § 101.30 indicates that the proposed action is located in Brewster County, which is currently unclassified or in attainment of the National Ambient Air Quality Standards for all six criteria air pollutants. Therefore, general conformity does not apply.

Although any demolition, construction, rehabilitation or repair project will produce dust and particulate emissions, these actions should pose no significant impact upon air quality standards. Any minimal dust and particulate emissions should be easily controlled by the construction contractors using standard dust mitigation techniques.

We recommend the environmental assessment address actions that will be taken to prevent surface and groundwater contamination.

Thank you for the opportunity to review this project. If you have any questions, please call Ms. Betty Thompson at (512) 239-1627.

Sincerely,

A handwritten signature in cursive script that reads "Thomas W. Weber".

Thomas W. Weber, Manager
Water Programs, Chief Engineer's Office

APPENDIX C Statements of Findings for Floodplains

DRAFT
Statement of Findings
for
Executive Order 11988 (Floodplain Management)
Construction of New Housing and Operations Facilities
Panther Junction
Big Bend National Park, Texas

RECOMMENDED:

Superintendent, Big Bend National Park

Date

CONCURRED:

Chief, Water Resources Division

Date

APPROVED:

Director, Intermountain Region

Date

INTRODUCTION

This Statement of Findings (SOF) has been prepared in accordance with Executive Order 11988 (Floodplain Management), Director's Order #77- 2, and the National Park Service (NPS) guideline for implementing these orders, including Procedural Manual #77- 2 (Floodplain Management). The SOF summarizes the floodplain development associated with actions to construct housing and other operational facilities at the Panther Junction developed area of Big Bend National Park that were included in the Proposed Action as described and evaluated in the *Environmental Assessment for Construction of New Housing and Operations Facilities, Big Bend National Park*. The SOF also describes the reasons why encroachment into the floodplain is required to implement the project, the site- specific flood risks involved, and the measures that will be taken to mitigate floodplain impacts.

Proposed Action

The new construction at Panther Junction would include:

- Duplex for Big Bend Natural History Association staff
- Storage Building for Science and Resource Management staff and equipment
- Gas Station/ Convenience Store expansion
- U.S. Border Patrol Housing
- Law Enforcement Complex, including
 - U.S. Border Patrol Offices
 - NPS Law Enforcement Offices
 - Ranger Staff Offices
 - Detention Center
 - Bus/Boat Bays
 - River Operations and Search/Rescue Caches
 - Driveway, parking lot and utilities
- Housing Complex, including
 - Concession Housing
 - NPS Staff Seasonal Housing
 - Fire Dorm
 - Recreational Facility
 - Tennis Court

The purpose of the proposed new construction is to provide a safe, healthy, functional, and efficient working environment for the Big Bend National Park staff, U.S. Border Patrol and Big Bend Natural History Association staff. The new construction represents an expansion of operational facilities needed under the current *Big Bend National Park General Management Plan* (GMP) (NPS 2004). New construction will comply with applicable NPS policies.

Brief Site Description

The Panther Junction Developed Area of Big Bend National Park is located in the central portion of the park. It is the location of a visitor center, the principal administrative area for the park (headquarters, maintenance, resource office building, and collections

storage), gas station, store, post office, school and housing units. The entire development is in a flash flood prone area. Therefore the regulatory floodplain is that inundated by the Maximum Estimated Flood (Director's Orders 77-2). This is an extremely large event with a very low probability of occurrence. It is used as the regulatory floodplain here to provide a high degree of safety from runoff events that may inundate an area in a very short time (NPS WRD 1995: "Estimation of Flood and Geomorphic Hazard in the Panther Canyon Area of Big Bend National Park Texas").

The location of the proposed work is within a developed area adjacent to existing housing and other structures. This area for the new construction occurs on alluvial materials at an elevation of approximately 3,800 feet.

JUSTIFICATION FOR USE OF THE REGULATORY FLOODPLAIN

The area proposed for new construction at Panther Junction is within and adjacent to existing housing structures. This developed area is the main location of the park's administrative facilities. The new construction includes replacement housing and recreational facilities as well as an expansion of emergency and law enforcement services. The replacement construction is covered by the GMP. The expanded emergency and law enforcement facilities are a necessary response to a changing political and defense climate along the border. The alternative of moving all development out of Panther Junction was considered and rejected out of a desire to minimize disturbance to cultural sites, reduce disturbances to natural resources and because of the very high fiscal redeveloping infrastructure at another location. The addition of facilities in Panther Junction offers the opportunity to realize efficiencies by integrating facilities while keeping essential facilities centrally located. Panther Junction is located at the intersection of the roads leading from the two park entrances making it the ideal location for emergency and law enforcement services, the visitor center and administrative facilities for the park. In addition, any new location picked from the central portion of the park would likely have similar geohazards.

FLOOD RISK

According to an internal NPS memorandum, all of the structures at Panther Junction are located on the uppermost end of a series of coalescing alluvial fans. There are three specific flood related hazards associated with this location: bank loss due to erosion, inundation from floodwaters, and destruction from debris flows. Additionally, an overriding hazard exists in the long periods between devastating events, which may create the illusion of inactivity. Lastly, hazardous flood events, when they do take place, may occur in a very short time period due to the relatively small and steep watershed, allowing little opportunity for warning or evacuation. Consequently, this area is considered flash flood prone, and the resulting regulatory floodplain is the Maximum Estimated Flood (Qme) (Internal Memorandum, Michael Martin, Hydrologist, Water Operations Branch, Water Resources Division, National Park Service to Superintendent, Big Bend National Park, April 14, 2000)

In general, the fan is an undesirable place for development because it is geomorphically unstable, flood prone, possibly debris prone and has areas that are prone to bank failure. Since property loss due to bank failure would be complete, no new structures

will be built near unstable banks and several existing structures currently threatened by bank failure will be moved under this project. The maximum possible flood, which is the Regulatory Floodplain in this case, would inundate some most areas to a depth of less than two feet, would be highly irregular and diffuse. Two new Border Patrol houses on the east side of Mouse Creek would be inundated to a depth of seven feet. Property losses under this scenario would be tolerable. Debris flows, while being geologically important, are rare. A 2000 investigation aimed at identifying source material for debris flows did not identify significant supplies. The low gradient of the Panther Arroyo channel above Panther Junction coupled with insignificant sources of material minimizes the ability of the channel to transport a debris flow. .

When viewed in the context of long-term occupancy, the entire development is likely at some risk. The channel is actively migrating and bank loss threatens several structures. Buildings constructed on the lower portion of the fan, including the curatorial storage building, are likely to experience inundation from high magnitude flows. Shifting of the active channel to a distributary channel through aggradation would potentially flood portions of the fan far removed from the main channel, and the most extreme floods that could be expected from this size watershed could inundate the entire area. The hazard of debris flow is not certain, but, if possible, could be extremely destructive. All of the structures at Panther Junction are at "some risk" according to the report. However, the report also seems to indicate that the risk is not great. Nevertheless, because the long period between events leads to a false sense of security and warning time would be short, there is the possibility of human injury or loss of life in the event of a large flood. In addition, a large investment in infrastructure could be lost if the 500-year or Qme does occur.

MITIGATION OF RISK TO PEOPLE AND STRUCTURES

The Park Service will create a developed area warning and emergency action plan to ensure that employees, employee families, school children and visitors receive adequate warning so that they suffer no ill effects from flooding. No new construction is planned along the banks of Panther Arroyo where bank loss would undercut structures.

Preparation of the developed area warning and evacuation plan would lower the threat to life within Panther Junction. However, injury or loss of life from flooding could not be completely prevented. The park will develop the plan, regularly educate staff and visitors in its detail, and periodically review it with any additional relevant weather or flooding information that becomes available.

The NPS will provide flood protection differently for humans and structures. Human safety will be provided for all flows through the emergency action plan. The NPS has designed and placed structures to withstand the expected hydraulic conditions associated the 100-year flood. However, since structures will be placed in the 500 year floodplain, some risk to the structures will be present and tolerated.

SUMMARY

The NPS concludes that there is no practical alternative to construct new housing and operational facilities within the regulatory floodplain at Panther Junction within Big

Bend National Park. Mitigation and compliance with regulations and policies to prevent impacts to water quality, floodplain values, and loss of property or human life would be adhered to during and after the construction. No long-term adverse impacts to the floodplain would occur from the Preferred Alternative. Therefore, the National Park Service finds the Preferred Alternative to be acceptable under Executive Order 11988 for the protection of floodplains.

DRAFT
Statement of Findings
for
Executive Order 11988 (Floodplain Management)
Construction of New Housing and Operations Facilities
Rio Grande Village
Big Bend National Park, Texas

RECOMMENDED:

Superintendent, Big Bend National Park

Date

CONCURRED:

Chief, Water Resources Division

Date

APPROVED:

Director, Intermountain Region

Date

INTRODUCTION

This Statement of Findings (SOF) has been prepared in accordance with Executive Order 11988 (Floodplain Management), Director's Order #77- 2, and the National Park Service (NPS) guideline for implementing these orders, including Procedural Manual #77- 2 (Floodplain Management). The SOF summarizes the floodplain development associated with actions to construct housing and expand RV facilities at the Rio Grande Village area of Big Bend National Park that were included in the Proposed Action as described and evaluated in the *Environmental Assessment for Construction of New Housing and Operations Facilities, Big Bend National Park*. The SOF also describes the reasons why encroachment into the floodplain is required to implement the project, the site- specific flood risks involved, and the measures that will be taken to mitigate floodplain impacts.

Proposed Action

The new construction at Rio Grande Village would include:

- U.S. Border Patrol Housing (two new structures)
- Expand NPS Staff Seasonal RV Pad area by adding 3 hookup sites
- Law Enforcement Ranger Housing (one new structure)

The purpose of the proposed new construction is to provide a safe, healthy, functional, and efficient working environment for the Big Bend National Park staff and U.S. Border Patrol. The new construction will also comply with the current *Big Bend National Park General Management Plan* (GMP) (NPS 2004) and applicable NPS policies.

Brief Site Description

The Rio Grande Village area of Big Bend National Park is located in the southeast portion of the park along the Rio Grande River. This area has a visitor center, a campground, a concessioner-operated 25-site RV full hook-up campground, a picnic area, a group campground, an amphitheater, a general store, a gasoline pump, and a self-guiding nature trail. According to the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (1985), the proposed U.S. Border Patrol housing, the Law Enforcement Ranger House and expansion of the NPS Staff RV Pad within Rio Grande Village are located inside the 100-year floodplain (See attachment). The location of the proposed work is within a developed area with existing housing. This area for the new construction occurs on a relatively level, high terrace deposit of alluvial materials at an elevation of approximately 2,300 feet.

JUSTIFICATION FOR USE OF THE FLOODPLAIN

The area at Rio Grande Village proposed for new construction is within and adjacent to existing housing structures. This developed area is the main location of staff housing at Rio Grande Village and is located entirely within the 100-year floodplain. Alternative locations would require moving the staff housing area, including associated infrastructure, into undeveloped areas outside the floodplain. Because of the cost and

potential adverse environmental effects of moving into undeveloped areas, the existing housing area was chosen as the site for the new construction.

FLOOD RISK

The proposed new construction would take place in an area designated as Zone A on the FEMA Flood Insurance Rate Map (1985). Zone A is defined as areas with a 1% annual chance of flooding but because no detailed analyses have been performed, base flood elevations are not known. As stated in the 2004 GMP, because flooding occurs only in extremely large and rare events, and flood flow velocities are very small, the possibility of the loss of life at Rio Grande Village is very small.

MITIGATION OF RISK TO PEOPLE AND STRUCTURES

In the rare event that flooding would threaten the new structures, it is expected that due to the nature of large floods on the Rio Grande, adequate time would be available to evacuate persons and mobile property out of harm's way. Water damage to the permanent structures could occur in the event of flooding, but damages due to high velocities are unlikely.

Selective closure options described in an operational plan would lower the threat to life and property within the developed area. The park will develop this plan, regularly educate staff and visitors in its detail, and periodically review it with any additional relevant weather or flooding information that becomes available.

SUMMARY

The NPS concludes that there is no practical alternative to construct new housing and expand RV facilities within the 100-year floodplain at Rio Grande Village within Big Bend National Park. Because of the rare nature of extreme floods on the Rio Grande, risk to people and structures are expected to be minimal. Mitigation and compliance with regulations and policies to prevent impacts to water quality, floodplain values, and loss of property or human life would be adhered to during and after the construction. No long-term adverse impacts would occur from the Preferred Alternative. Therefore, the National Park Service finds the Preferred Alternative to be acceptable under Executive Order 11988 for the protection of floodplains.