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U.S. Fish and Wildlife Service
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In Reply Refer To:

AESO/SE

22410-2007-F-0416

August 29, 2007

22410-2004-I-0270

22410-2003-I-0235

22410-2002-I-0156

Mr. George Hutchinson
U.S. Department of Homeland Security
Customs and Border Protection
1300 Pennsylvania Avenue NW
Room 3.4-D
Washington, D.C. 20229

Dear Mr. Hutchinson:

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated August 23, 2007, and received by us electronically on August 24, 2007. Your proposed action includes pedestrian fence proposed along the U.S. and Mexico border near Sasabe, Pima County; Nogales, Santa Cruz County; and near Naco and Douglas, Cochise County. You requested formal consultation on the endangered jaguar (*Panthera onca*) and the endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*). You did not want to receive a draft biological opinion.

You also requested our concurrence the proposed action may affect, but is not likely to adversely affect the endangered Kearney blue star (*Amsonia kerneyana*). We concur with your determination, based on the rationale in Appendix A.

This biological opinion is based on information provided in your letter, an August 2007 biological assessment (BA) for the project (USCBP 2007b), the Naco-Douglas Supplemental Environmental Assessment (EA) (USCBP 2003), the Final EA for Nogales (USCBP 2003), the Final EA for Tucson, Nogales, and Sonoita Stations (USCBP 2004), and the Final Sasabe Fence EA (USCBP 2007), field investigations, our files, and other sources of information. References cited in this opinion are not a complete bibliography of all references available on the listed species evaluated, effects of the proposed action, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

Consultation history

- August 9, 2007: Teleconference among USFWS, Office of Border Patrol (OBP), and U.S. Army Corps of Engineers (USACE) to discuss the potential for adverse effects to the jaguar. Major concerns included the need to address potential direct and indirect effects to jaguar of all the fence projects that are proposed within or near jaguar movement corridors.
- August 14, 2007: Meeting among USFWS, Customs and Border Protection (CBP), Sundt Construction, OBP, USACE, and Gulf South Research Corporation (GSRC) to discuss the impacts of the Sasabe fence on jaguars, and if the Naco/Douglas fence should be included in consultation.
- August 15, 2007: Teleconference among USFWS, CBP, OBP, USACE, and GSRC to discuss why formal consultation is necessary and to discuss conservation measures for the jaguar.
- August 17, 2007: We received a preliminary draft BA to review, and sent comments on August 19 to USACE and GSRC.
- August 21, 2007: We received another preliminary draft BA to review and sent comments on August 22 to USACE and GSRC.
- August 23, 2007: You sent the request for formal consultation via electronic mail.
- August 24, 2007: We received the final BA via electronic mail.

BIOLOGICAL OPINION

DESCRIPTION OF PROPOSED ACTION

The project is divided into three separate corridors (Figure 1). The western most corridor is near the Sasabe Port of Entry (POE) within the Tucson Station's Area of Operation (AO). Proposed pedestrian fence in this section starts at the POE and extends 2.5 miles to the west and 4.5 miles to the east (7 miles total) (Figure 2). The second section extends 2.4 miles west of Mariposa POE in Nogales, beginning about 0.5 mile west of the Mariposa POE (Figure 3). The third corridor is located in the Naco and Douglas stations' AOs and encompasses a total of 22 miles from Douglas to the San Pedro River (but does not cross the San Pedro River). These areas of fence extend primarily 6 miles west of the Naco POE, 9 miles east of the Naco POE, and 7 miles west of the Douglas POE (Figures 4 and 5).

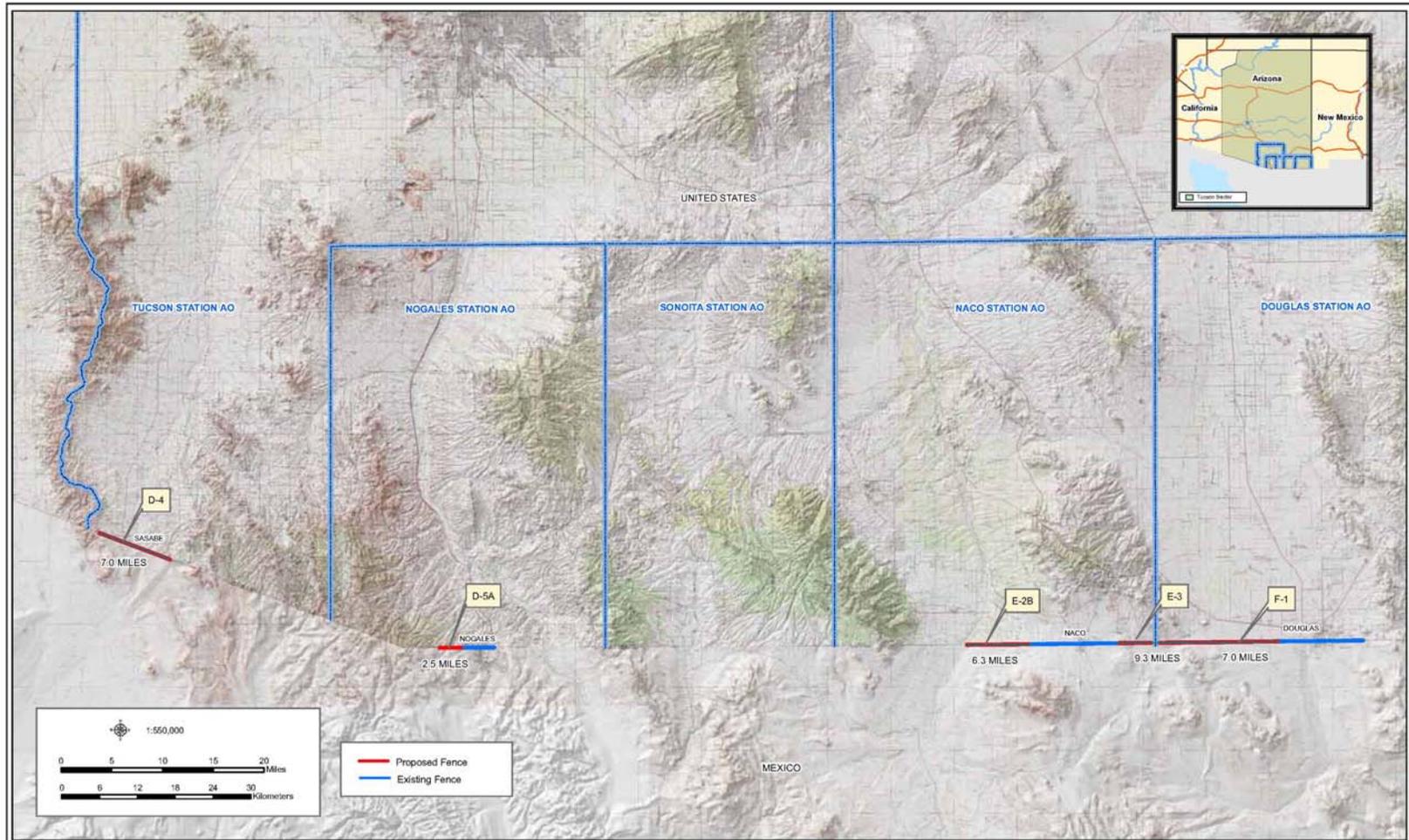
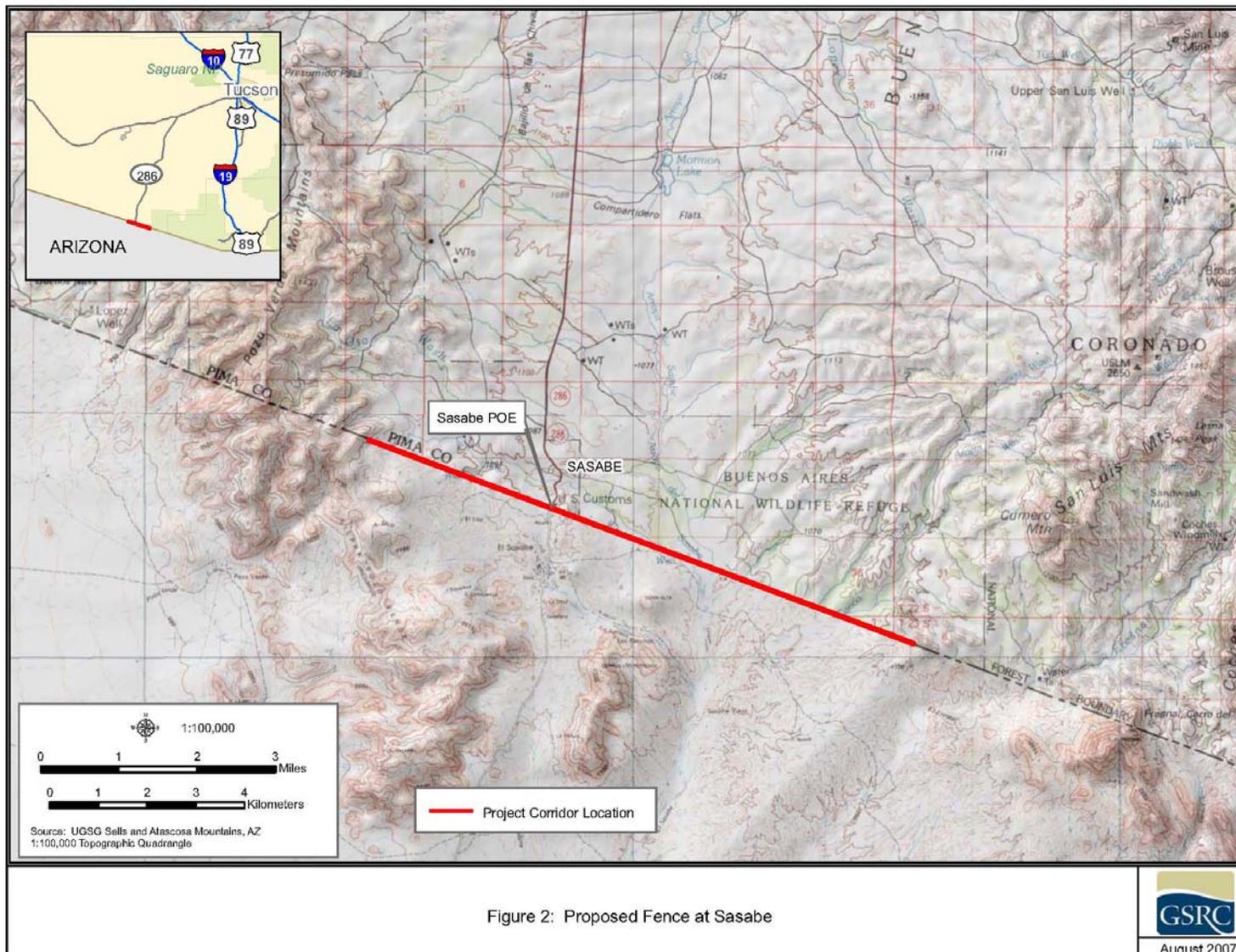


Figure 1: Proposed Fences



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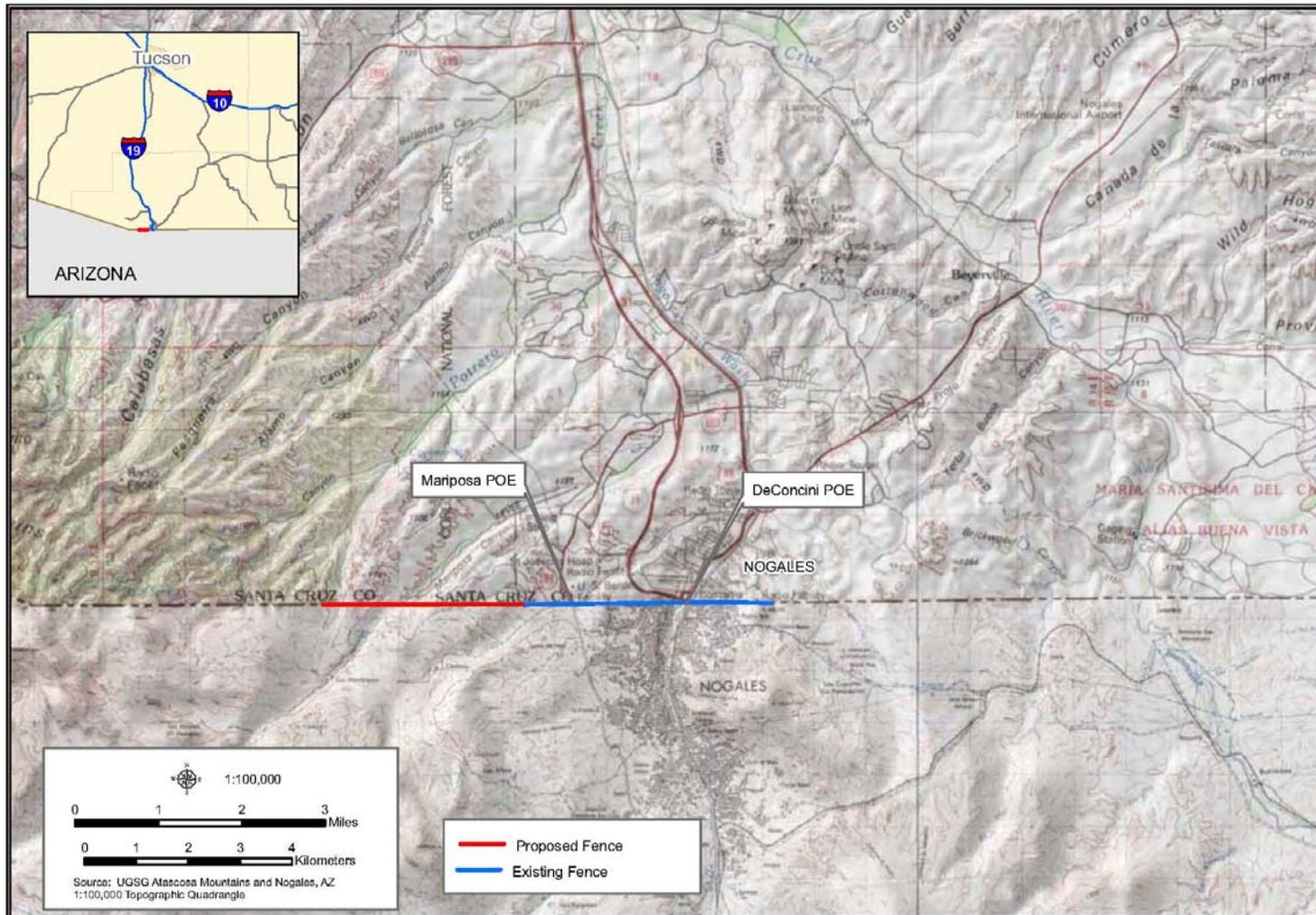


Figure 3: Proposed Fence at Nogales



August 2007

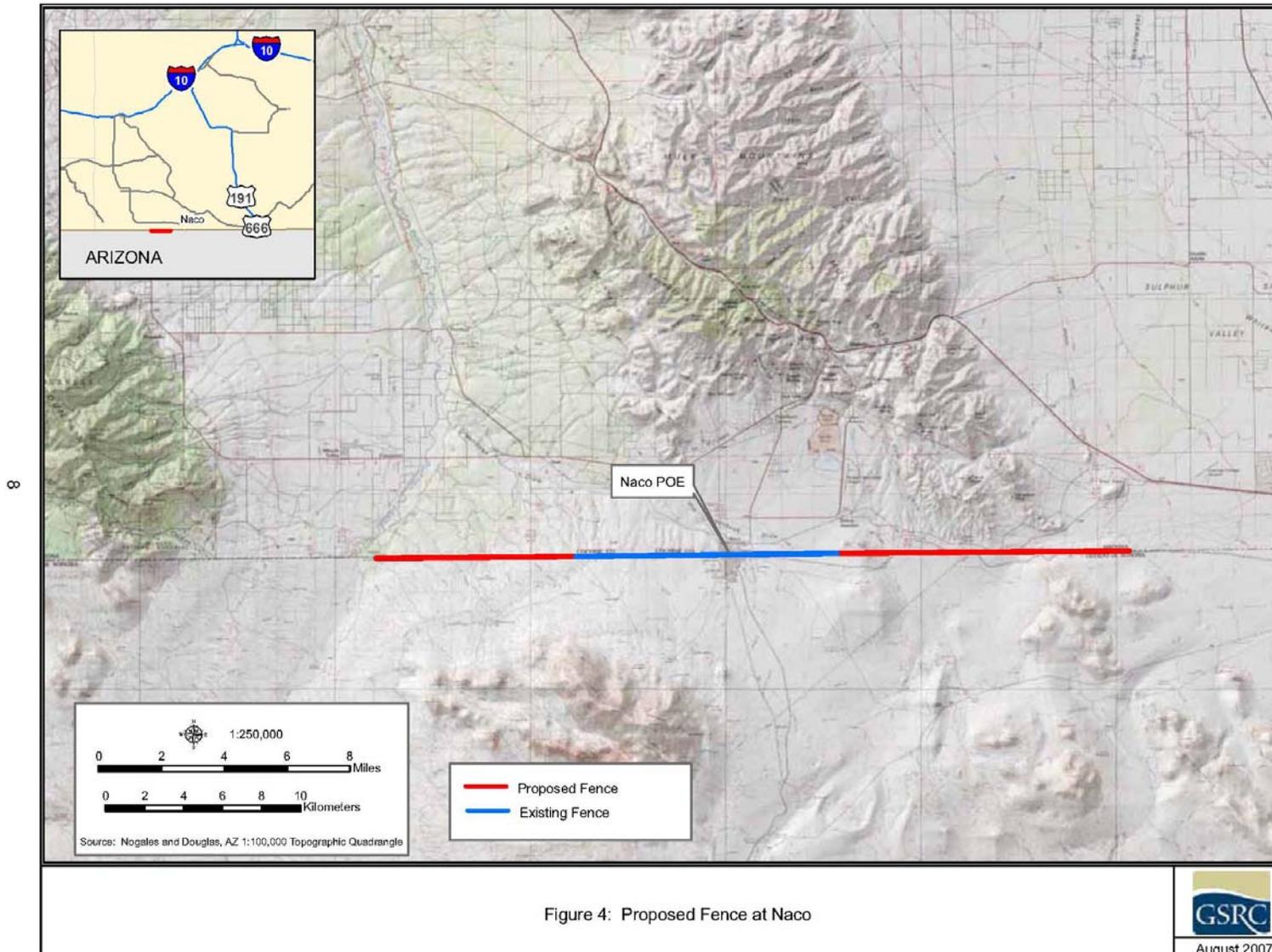


Figure 4: Proposed Fence at Naco

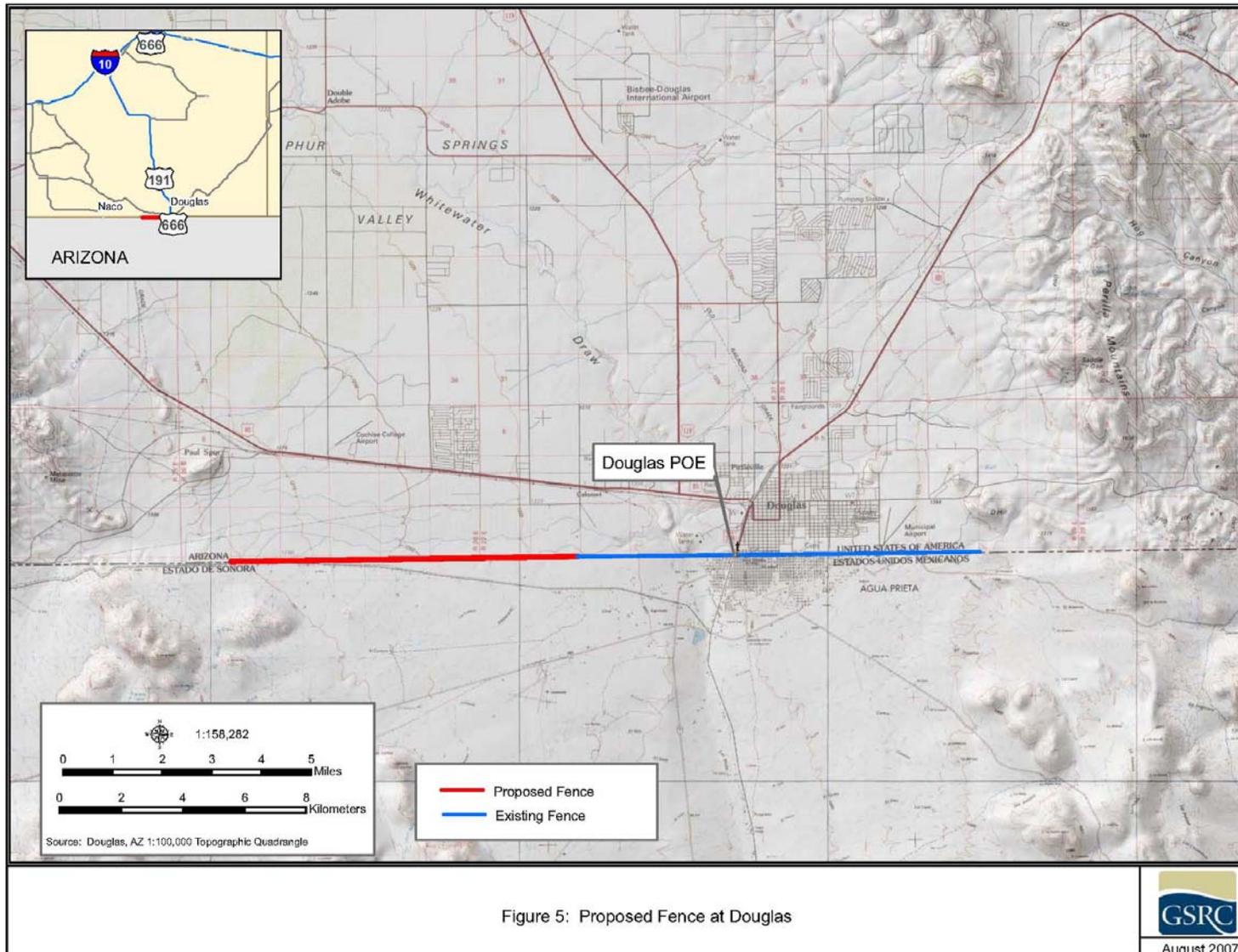


Figure 5: Proposed Fence at Douglas

The pedestrian barrier would be placed about three feet north of the U.S.-Mexico border, within the 60-foot-wide Roosevelt Reservation. The exact fence design is not yet known; however, preliminary design performance measures dictate that the fence must:

- extend 15 to 18 feet above ground and 3 to 6 feet below ground;
- be capable of withstanding a crash of a 6,000 to 10,000-pound (gross weight) vehicle traveling at 40 miles per hour;
- be semi-transparent, as dictated by operational need;
- be vandal resistant;
- be designed to survive the extreme climate changes of a desert environment;
- not impede the natural flow of water and have minimal impacts on small animal movement; and
- not impede maintenance access to border monuments required by the U.S. Section, International Boundary and Water Commission (USIBWC).

The final design and construction of the fence will be developed by the design and build contractor. Upon completion, the entire length of fence in all three sections will be approximately 31 miles. No primary fence would be constructed within the 100-year floodplain of the San Pedro River. Furthermore, in washes or arroyos, fences would be designed and constructed, as appropriate, to ensure proper conveyance of floodwaters and to eliminate the potential to cause backwater flooding on either side of the border. There are not likely to be gaps greater than four inches in the fence, even in washes.

Construction of the fence would require clearing and grading approximately 225 acres, including about 215 acres of agaves, to construct an access road that fully encompasses the 60-foot-wide Roosevelt Reservation. This road would be used for fence maintenance in the future. No additional improvements (e.g. all-weather surfacing) would be implemented as part of the Proposed Action in the Sasabe and Nogales AOs; however, roads in the Naco-Douglas area will be improved to an all-weather surface road with parallel drainage ditches and drag road. Maintenance of the pedestrian barrier is part of the proposed action.

These all-weather roads would be surfaced with an aggregate surface and treated with a soil stabilizer. On completion of the road improvements, only a top shot (i.e., small quantity applied to the surface) of the soil stabilizer would be required at a frequency anticipated not to exceed more than once per year for maintenance purposes to ensure the longevity of the roadways. The OBP would maintain the improved roads upon completion of the construction activities. This top shot would not require any ground disturbing activities, and careful application of the stabilizer would ensure no material is spread outside of the road right-of-way (ROW). Surfacing is required to reduce maintenance costs and improve driving conditions during inclement

weather. Surfacing would also reduce fugitive air particles created by OBP and private vehicles while traveling on unimproved roads. These types of road surfacing materials are approved by the U.S. Environmental Protection Agency (EPA) and are non-toxic to fish and wildlife.

Construction is expected to be completed in 60 days or less, though it may take longer. Equipment required for the construction activities would not be staged or maintained in or near any surface water resources to prevent any contamination from petroleum, oil, and lubricant spills that could occur.

Work will be done during daylight hours to the extent practicable. Nighttime construction activities would be conducted only when absolutely necessary for adequate concrete pours or in the case of an accelerated construction schedule to meet Congressional mandates. No nighttime construction will be conducted in vegetated washes. Portable lights with generators would be used during nighttime construction. However, lights would be equipped with shields to focus the illumination on the work area and reduce light trespass into other areas.

Conservation Measures

- Work within drainages will be limited to dry periods to reduce downstream water quality effects.
- If the migratory bird nesting season (February 1 – August 31) can not be avoided, bird nests will be located and identified immediately before grubbing and clearing activities. Active nests will be avoided to the extent practicable.
- CBP/OBP will attempt to avoid disturbance to agave and other plant species that are used by lesser long-nosed bats for forage, to the extent practicable. Such specimens will be avoided, salvaged, or replaced at a ratio of 2:1 from local nursery stock.
- Any temporarily disturbed soils would be stabilized and revegetated with native species, including cottonwood and willow saplings at washes and arroyos, to provide erosion and sedimentation control. Disturbed areas would also be sprayed with a hydroseed mixture to establish an herbaceous cover more rapidly.
- Engineering solutions (e.g., box culverts) would be developed and implemented in arroyos and washes. The solutions will be designed to prevent illegal traffic; such traffic would adversely affect habitat and disturb jaguars that might be using the wash. Additionally, vegetation should be maintained in these washes and no lights should be placed near such washes.
- CBP will support USFWS in jaguar survey and monitoring efforts and conservation and recovery measures. Survey and monitoring methods and conservation and recovery measures will be developed through coordination with USFWS, Arizona Game and Fish Department (AGFD), and the Tohono O’odham Nation within four months following the release of the Biological Opinion. Details and schedules regarding those methods and measures will be identified by the end of the four months. Monitoring of jaguars may

include a combination of satellite telemetry and camera survey techniques. Multiple techniques may be used to monitor jaguar habitat; however, one component of monitoring would likely include an assessment of indirect effects to jaguar movements and habitat from border traffic in areas where no fence is installed.

- CBP will install additional technology (cameras, sensors, etc.) to the east and west of the fence segments and near other gaps where higher quality habitat exists to deter the entry of illegal pedestrians, particularly into the mountainous regions and larger riparian areas (Baboquivari Mountains, San Pedro River). OBP will provide information to the USFWS on jaguar and other felid (i.e., mountain lion, ocelot, and bobcat) sightings obtained through remote video surveillance (or any other means like direct observation) along the border.

STATUS OF THE SPECIES

Jaguar

The jaguar was listed as endangered from the United States and Mexico border southward to include Mexico and Central and South America (37 FR 6476). The species was originally listed as endangered under the Endangered Species Conservation Act of 1969 (ESCA). Under the ESCA, two separate lists of endangered wildlife were maintained, one for foreign species and one for the United States. The jaguar appeared only on the foreign list. In 1973, the Endangered Species Act (Act) replaced the ESCA. The foreign and native lists were replaced by a single ‘‘List of Endangered and Threatened Wildlife,’’ (USFWS 1975). In 1979, we published a notice (44 FR 43705) stating that, through an oversight in the listing of the jaguar, the United States populations of these species were not protected by the Act. The notice asserted that it was always our intent that all populations of the jaguar deserved to be listed as endangered, whether they occurred in the United States or in foreign countries. Endangered status was extended to the jaguar in the United States in 1997 (62 FR 39147). Designation of critical habitat was found to be not prudent because designation may increase the chance of direct taking. Critical habitat designation was again analyzed in 2006, and it was found to be not prudent because there would be no conservation benefit to the species (71 FR 39335).

The jaguar was addressed in Listed Cats of Texas and Arizona Recovery Plan (with Emphasis on the Ocelot) (USFWS 1990), but only general information and recommendations to assess jaguar status in the United States and Mexico, and protect and manage occupied and potential habitat in the United States were presented. No specific recovery recommendations or objectives for the jaguar were presented. AGFD published an assessment and strategy in 1997 for jaguars in Arizona and New Mexico (Johnson and Van Pelt 1997), which was accepted by the Jaguar Conservation Team (JAGCT). The AGFD and the New Mexico Department of Game and Fish (NMDGF) are currently developing an updated assessment and framework for jaguars in Arizona, New Mexico, and northwestern Mexico (AGFD and NMDGF 2006), along with a new Memorandum of Understanding for the JAGCT.

Rangewide, jaguars measure about five to eight feet from nose to tip of tail and weigh from 80 to 348 lb, although the 80 and 348 lb weights are exceptional (Nowak 1999, Seymour 1989). Males

are typically 10 to 25 percent larger than females (Emmons 1999, Wildlife Conservation Society 2007), or perhaps 20 to 30 percent larger (Sunquist and Sunquist 2007). In the southern part of the range, females tend toward 100 to 150 lb and males toward 170 to 220 lb. In Central America and southern Mexico, both sexes trend slightly larger than they do to the north or south. Leopold (1959) listed a weight range in Mexico of 140 to 250 lb for males and 100 to 180 lb for females. Jaguars have a relatively robust head, compact but muscular body, short limbs and tail, and powerfully built chest and forelegs (Leopold 1959, Nowak 1999, Seymour 1989, Tewes and Schmidly 1987, Wildlife Conservation Society 2007). They have the strongest teeth and jaws of any American cat, and their skulls are more massive than those of mountain lions (Brown and López-González 2001). Their canines are well developed (Seymour 1989) and effectively deployed. The overall coat of a jaguar is typically pale yellow, tan, or reddish yellow above, and generally whitish on the throat, belly, insides of the limbs, and underside of the tail, with prominent dark spots or blotches throughout (Seymour 1989).

The life history of the jaguar has been summarized by Seymour (1989), among others. Jaguars breed year-round range-wide, but at the southern and northern ends of their range there is evidence for a spring breeding season. Gestation is about 100 days; litters range from one to four cubs (usually two). Cubs remain with their mother for nearly two years. Females begin sexual activity at three years of age, males at four. Studies have documented few wild jaguars more than 11 years old.

Like most large carnivores, jaguars have relatively large home ranges. According to Brown and Lopez-Gonzalez (2001), their home ranges are highly variable and depend on topography, available prey, and population dynamics. However, little information is available on this subject outside tropical America, where several studies of jaguar ecology have been conducted. Quigley and Crawshaw (1992) estimated a minimum of 772 to 1160 mi² is needed to support 30 to 50 adult jaguars; the actual area depends on prey density, habitat composition, and the amount of human exploitation. Individual jaguar home ranges vary from 11 to 16 mi² in Belize (Rabinowitz and Nottingham 1986) and from 10 to 25 mi² for females in the dry and wet seasons, respectively, in Jalisco, Mexico (Nuñez et al. 2002). The average home range of radio-collared male jaguars in Venezuela was 19 to 30 square miles (49 and 78 sq km) (Brown and Lopez-Gonzalez 2001:60).

The list of prey taken by jaguars range-wide includes more than 85 species (Seymour 1989). Known prey include peccaries (javelina), capybara, paca, armadillos, caimans, turtles, livestock, and various birds and fish. Although it is thought that javelina and deer are mainstays in the diet of jaguars in the U.S.-Mexico borderlands, other available prey, including livestock, are probably taken as well.

Jaguars are known from a variety of vegetation communities (Seymour 1989), including those found in the arid Southwest (Nowak 1994). Toward and at middle latitudes, they show a high affinity for lowland wet communities, typically swampy savannas or tropical rain forests. However, they also occur in upland vegetation communities in warmer regions of North and South America. For example, jaguars occur in dry tropical forest in Jalisco (Nuñez et al. 2000) and southern Sonora (Alamos region) (E. Rojero Diaz, pers. comm.). Swank and Teer (1989) stated that jaguars prefer a warm, tropical climate, usually associated with water, and are rarely found in extensive arid areas. However, jaguars occur in arid areas, including thornscrub, desertscrub, and grassland communities, of northwestern Mexico (Boydston and López-González 2005, McCain and Childs in review).

López-González and Brown (2002) and southwestern United States (Johnson et al. 2007). Recently, several studies have helped refine general understanding of habitats that have been or might be used by jaguars in Arizona and New Mexico, including studies by the Sierra Institute Field Studies Program (2000), Hatten et al. (2002 and 2005), Menke and Hayes (2003), Boydston and López-González (2005), and Robinson et al. (2006).

Sanderson et al. (2002) found that the jaguar is known to be extant in about 3.4 million mi², which represents 46% of its historical range. Jaguars are known to be extirpated in 37% of their historical range, and their status in another 18% is unknown. The probability of long-term survival of the jaguar is considered high in 70% of the currently occupied range (over 2.3 million mi²). Abundance and population trends for the species are still not well known, though research, inventories, and monitoring programs are being implemented in some parts of the jaguar range (IUCN 2007, Wildlife Conservation Society 2007).

Numerous sightings of jaguars have been recorded in northern Mexico and southwestern United States since the 1997 listing (Brown and López-González 2001, AGFD and NMDGF 2006), either because of increased efforts in detecting individuals or increased movements of individuals across the border, or both. Jaguars in the United States are part of a population, or populations, that occur largely in Mexico. As the listing rule (62 FR 39147) discusses, jaguars in the United States historically occurred in California, Arizona, New Mexico, Texas, and possibly Louisiana. The last jaguar sightings in California, Texas, and Louisiana were documented in the late 1800s or early 1900s. While jaguars have been documented as far north as the Grand Canyon, sightings in the late 20th century to the present have occurred mainly along the international boundary of the United States and Mexico. Further, only three records of a female with kittens have been documented in the United States, the last in 1910 (Lange 1960, Nowak 1975, Brown 1989), and no females have been confirmed in the United States since 1963 (Brown and Lopez-Gonzalez 2000). Based on documented sightings in the late 20th century, occurrences in the United States at the time of listing (62 FR 39147) were limited to southeastern Arizona and southwestern New Mexico. Recently (1996 through 2007), four male jaguars have been documented in the United States.

Swank and Teer (1989) described the distribution of the jaguar in Mexico as a broad belt from central Mexico to Central America. However, Brown (1991) suggested that there may be more jaguars in northern Mexico than are officially reported. He mentioned reports of two jaguars, which were killed in central Sonora around 1970. He also discussed assertions by the local Indians that both male and female jaguars still occurred in the Sierra Bacatete about 200 miles (323 kilometers) south of Arizona. Brown speculated that if a reproducing population of jaguars is still present in these mountains, it may be the source of individuals that travel northward through the Sierra Libre and Sierra de Madera and the possible source of the males that have been documented in the United States. Brown and Lopez-Gonzalez (2001) summarize reports of jaguars killed or captured in the Mexican states of Sonora and Chihuahua from 1900 to 2000. These authors also discuss an extant population of jaguars in Sonora. They describe an extant population in the rugged barrancas connecting northern Sinaloa and Sonora and another population in the Sierra Bacatete area in southern Sonora. However, the most northern population of jaguars reported by Brown and Lopez-Gonzalez (2001) is near the towns of Huasabas and Sahuaripa 130 miles (210 kilometers) south of the United States-Mexico border.

Rabinowitz (1997, 1999) suggested that there is a lack of evidence to support the presence of a significant United States population and stated that the southwestern United States has been “never more than marginal habitat at the extreme northern limit of the jaguar’s range.” He stated that several points stand out: (1) The low number of confirmed or credible sightings in the last century imply that there was no more than small, short-lived populations in the United States over the last century; (2) 74 percent of the sightings being male may be indicative of dispersal movements from south of the border; (3) the likelihood of jaguars coming across the border from Mexico points to a strong possibility for jaguar populations in northern Mexico; (4) only three sightings of females with young in the early 1900s is not indicative of a long-term breeding population; and (5) the lack of references by Native Americans and early Europeans suggests a lack of permanent presence within the last several hundred years. He further concluded that there is no area in the United States that is critical for the survival of any northern jaguar population that may occur in Mexico, or for the species as a whole.

Throughout their range, jaguars are at risk due to over hunting of jaguar prey animals and killing of jaguars due to perceived livestock depredation and for sport hunting. Increased illegal and law enforcement actions along the Mexico-United States border may be limiting jaguar movement across the border, but it is uncertain if and how much this is affecting that movement. Loss, fragmentation, and modification of jaguar habitat have contributed to population declines throughout much of the species’ range, including northern Mexico (Medellin et al. 2002). These changes in jaguar habitat have affected not only habitat for breeding and foraging, but also movement corridors.

According to the 1997 federal listing, the primary threat to jaguars in the United States is illegal shooting. The most recent known killing of a jaguar in Arizona was in 1986, (Brown and Lopez-Gonzalez 2001). Although the demand for jaguar pelts apparently has diminished, it still exists, along with the business of illegal hunting of jaguars in Mexico.

Lesser long-nosed bat

The lesser long-nosed bat was listed (originally, as *Leptonycteris sanborni*; Sanborn's long-nosed bat) as endangered in 1988 (USFWS 1988). No critical habitat has been designated for this species. A recovery plan was completed in 1997 (USFWS 1997a). Loss of roost and foraging habitat, as well as direct taking of individual bats during animal control programs, particularly in Mexico, have contributed to the current endangered status of the species. The recovery plan states that the species will be considered for delisting when three major maternity roosts and two post-maternity roosts in the United States, and three maternity roosts in Mexico have remained stable or increased in size for at least five years, following the approval of the recovery plan.

The lesser long-nosed bat’s habitat is desert grassland and shrubland up to oak transition (AGFD 2003a). According to the AGFD, this species’ preferred plant communities are palo verde/saguaro, semidesert grassland, and oak woodland. The lesser long-nosed bat is migratory and found throughout its historical range, from southern Arizona and extreme southwestern New Mexico, through western Mexico, and south to El Salvador. In southern Arizona, lesser long-nosed bat roosts have been found from the Picacho Mountains (Pinal County) southwest to the

Agua Dulce Mountains (Pima County), southeast to the Chiricahua Mountains (Cochise County), and south to the international boundary. Individuals have also been observed near the Pinaleno Mountains (Graham County) and as far north as Phoenix and Glendale (Maricopa County) (AGFD Heritage Data Management System). This bat is also known from far southwestern New Mexico in the Animas and Peloncillo mountains (Hidalgo County).

Roosts in Arizona are occupied from April to as late as early November (Cockrum and Petryszyn 1991, Slauson 1999, 2000); although the species has been recorded in winter at hummingbird feeders in Tucson (Sidner and Houser 1990). In spring, adult females, most of which are pregnant, arrive in Arizona and gather into maternity colonies in southwestern Arizona. These roosts are typically at low elevations near concentrations of flowering columnar cacti. After the young are weaned, maternity colonies disband in July and August; some females and young move to higher elevations, ranging up to more than 6,000 ft, primarily in southeastern Arizona near concentrations of blooming paniculate agaves. Dates of these seasonal movements by lesser long-nosed bats are rather variable from one year to the next (Cockrum and Petryszyn 1991, Fleming et al. 1993). Adult males typically occupy separate roosts, forming bachelor colonies. Males are known mostly from the Chiricahua Mountains, but also occur with adult females and young of the year at maternity roosts (USFWS 1997a). Throughout the night, between foraging bouts, both sexes will rest in temporary night roosts (Hoffmeister 1986).

The lesser long-nosed bat consumes nectar and pollen of paniculate agave flowers and the nectar, pollen, and fruit produced by a variety of columnar cacti. In Arizona, four species of agave and two cacti are the main food plants (Hayward and Cockrum 1971, Wilson 1985). The agaves include Palmer's agave (*Agave palmeri*), Parry's agave (*A. parryi*), desert agave (*A. deserti*), and amole (*A. schotti*). Amole is considered to be an incidental food source. The cacti include saguaro and organ pipe cactus. Nectar of these cacti and agaves are high energy foods. Concentrations of food resources are patchily distributed, and the nectar of each plant species is only seasonally available. Cacti flowers and fruit are available during the spring and early summer; blooming agaves are available through the summer, primarily from July through early October, though Parry's agave and amole bloom earlier. Columnar cacti occur in lower elevation areas of the Sonoran Desert region, and paniculate agaves are found primarily in higher elevation desert scrub areas, desert grasslands and shrublands, and into the mountains. Parry's agave is usually found at higher elevations than Palmer's agave (Gentry 1982).

The lesser long-nosed bat is known to fly long distances from roost sites to foraging sites. Night flights from maternity colonies to flowering columnar cacti have been documented in Arizona at 24 km (15 mi), and in Mexico at 40 km (25 mi) and 61 km (38 mi) (one way) (Dalton et al. 1994; V. Dalton, Tucson, pers. comm., 1997; Y. Petryszyn, University of Arizona, pers. comm., 1997). A substantial portion of the lesser long-nosed bats at the Pinacate Cave in northwestern Sonora (a maternity colony) fly 40 to 50 km (25-31 mi) each night to foraging areas in Organ Pipe Cactus National Monument (USFWS 1997a). Horner et al. (1990) found that lesser long-nosed bats commuted 48 to 58 km (30-36 mi) round trip between an island maternity roost and the mainland in Sonora; the authors suggested these bats regularly flew at least 75 km (47 mi) each night. Lesser long-nosed bats have been observed feeding at hummingbird feeders many miles from the closest potential roost site (Petryszyn, pers. comm., 1997). Because these bats can fly

long distances to forage, the entire project area is within foraging distance of many known roosts.

Considerable evidence exists suggesting a dependence of *Leptonycteris* on certain agaves and cacti. Activities that adversely affect the density and productivity of columnar cacti and paniculate agaves may adversely affect populations of lesser long-nosed bats (Abouhalder 1992, USFWS 1997a). Excess harvest of agaves in Mexico, collection of cacti in the United States, and conversion of habitat due to urban expansion, agricultural uses, livestock grazing, and other development may contribute to the decline of long-nosed bat populations (USFWS 1988). Activities that directly or indirectly promote invasions or increased density of nonnative grasses, particularly Lehmann lovegrass (*Eragrostis lehmanniana*), species of *Bromus*, and Mediterranean grass (*Schismus barbatus*), may result in increased fire frequency and intensity (Minnich 1994). Sonoran Desert scrub is not adapted to fire.

Suitable day roosts and concentrations of food plants are the two resources that are crucial for the lesser long-nosed bat (USFWS 1997a). Caves and mines are used as day roosts. The factors that make roost sites useable have not yet been identified. Whatever determines roost suitability, the species is sensitive to human disturbance. Instances are known where a single brief human visit to an occupied roost caused a high proportion of lesser long-nosed bats to temporarily abandon their day roost and move to another. This sensitivity suggests that the presence of alternate roost sites may be critical when disturbance occurs.

Food requirements of the lesser long-nosed bat are very specific. Adequate numbers of flowers or fruits are required within foraging range of day roosts and along migration routes to support large numbers of this bat. Locations of good feeding sites play an important role in determining availability of potential roosting sites, and roost and food requirements must be considered jointly when discussing the habitat requirements of this bat. A suitable day roost is probably the most important habitat requirement, but potentially suitable roosts must be within reasonable foraging distances of sufficient amounts of required foods before this bat will use them. It seems evident that the lesser long-nosed bat forages over wide areas and that large roosts require extensive stands of cacti or agaves for food. Therefore, destruction of food plants many miles from a roost could have a negative impact on this bat (USFWS 1997a).

The lesser long-nosed bat recovery plan identifies the need to protect foraging areas and food plants. The lesser long-nosed bat recovery plan provides specific discussion and guidance for management and information needs regarding bat forage resources (USFWS 1997a).

Known major roost sites include 17 large roosts in Arizona and Mexico (USFWS 1997a, USFWS files). According to surveys conducted in 1992 and 1993, the number of bats estimated to occupy 16 of the 17 sites was greater than 200,000. A recently discovered roost in Cochise County may support an additional 25,000 bats. Twelve major maternity roost sites are known from Arizona and Mexico. According to the same surveys, the maternity roosts are occupied by a total of more than 150,000 lesser long-nosed bats. The numbers above indicate that, although many of these bats are known to exist, the relative number of known large roosts is small. Disturbance of these roosts and the food plants associated with them could lead to the loss of the

roosts. Limited numbers of maternity roosts may be the critical factor in the survival of this species.

The lesser long-nosed bat recovery plan (USFWS 1997a), listing document (USFWS 1988), the biological opinion of the proposed ongoing and future military operations and activities at Fort Huachuca (22410-2007-F-0132) (USFWS 2007a), and the biological opinion on effects of continued livestock grazing for four allotments in the Chiricahua Ecosystem Management Area (22410-2007-F-0313-R1 and 02-21-98-F-0399) (USFWS 2007b), all discuss the status of the species, and threats, and are incorporated by reference.

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

Action Area

The “action area” means all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. Jaguars in Arizona and New Mexico are likely part of a jaguar population that occurs in Sonora and eastern Chihuahua, Mexico. Activities that significantly affect jaguars in any portion of the aforementioned states may affect the size, structure, or distribution of this northern jaguar population. The action area for this biological opinion therefore includes the range of the jaguar in Sonora, eastern Chihuahua, Mexico and southern Arizona and New Mexico, U.S. The USFWS has determined that the action area for the lesser long-nosed bat includes the areas directly impacted by the barriers (including construction, maintenance, and access roads) and an area around the project defined by a circle with a radius of 36 miles (the maximum documented one-way foraging distance of the lesser long-nosed bat). The action area represents only a small portion of the lesser long-nosed bat’s range.

Europeans have influenced Southern Arizona for hundreds of years, and Native Americans have done so for much longer (Hastings and Turner 1965, Bahre and Hutchinson 1985, Bahre 1991, Tellman et al. 1997). Often cited human impacts in the area include vegetation type conversion, dewatering surface waters and aquifers, erosion and channel downcutting, loss or reduction of native species, introduction and spread of nonnative species, and habitat loss.

The existing conditions of the Sasabe corridor were discussed in detail in the 2007 EA and are incorporated by reference. The corridor area is comprised of Sonoran desertscrub with smaller desert scrub-grassland communities interspersed. The grassland communities are more prevalent on the eastern side of the Sasabe POE, primarily within the Buenos Aires National Wildlife Refuge (BANWR). Within the 60-foot wide Roosevelt Reservation (i.e., the project corridor) the vegetation communities have been disturbed by previous road construction, legal and illegal

grazing, illegal vehicle and pedestrian traffic, fires, temporary vehicle barriers (TVB), and OBP enforcement actions. The washes and arroyos support more dense vegetation communities comprised of mulefat (*Baccharis salicifolia*), catclaw acacia (*Acacia greggii*), catclaw mimosa (*Mimosa aculeaticarpa dysocarpa*), graythorn (*Ziziphus obtusifolia*), and desert honeysuckle (*Anisacanthus thurberi*).

The native bunch-grasses in the grassland community have suffered from overgrazing and fire suppression that have permitted or benefited the proliferation of invasive shrubs and cacti (Hastings and Turner 1980). The grasslands on the Mexican side of the border have been extensively overgrazed (Hastings and Turner 1980).

The Nogales corridor consists primarily of semidesert grassland, encinal oak woodlands, and riparian corridors. The grassland community is the most widely distributed community in the project corridor. This community is made up of grassy landscapes broken up by widely scattered scrub trees.

The encinal oak woodland community exists along slopes and is dominated by mature Emory oaks (*Quercus emoryi*) with an occasional gray oak (*Q. grisea*), and manzanita (*Arctostaphylos pungens*). Thin ribbons of mature netleaf hackberry (*Celtis reticulata*) are found along the banks of washes at the bottom of these slopes. Mature netleaf hackberry forms a closed canopy while younger netleaf hackberry forms a loose mid-canopy. Heavy cattle grazing was evident in each of the communities during past surveys (see BA).

The existing environmental conditions within the Naco-Douglas corridor were described in the 2003 Supplemental EA and those descriptions are incorporated by reference. The majority of the corridor consists of Chihuahuan desertscrub. However, the San Pedro Riparian National Conservation Area is on the western part of the project corridor, about 11 miles west of the Naco POE. The San Pedro River is a low-gradient, alluvial desert river that flows uninterrupted by dams or major surface water diversions from its headwaters 23 miles south of the U.S.-Mexico border north into Arizona where it joins the Gila River at Winkelman, Arizona (Rojo et al. 1998). The area surrounding the San Pedro River forms part of an ecotone, or intergrading of ecosystems, between Sonoran and Chihuahuan deserts and Plains grassland. Conditions contributing to the exceptional diversity and importance of the area to migratory birds include the San Pedro River's position along an ecotone (where species from two ecosystems contribute to the overall diversity), the highly productive and structurally diverse riparian habitat, the presence of water in a desert ecosystem, and the relatively unaltered hydrologic regime (Naiman et al. 1993, Rojo et al. 1998, Commission for Environmental Cooperation 1999).

Jaguar

In northwestern Mexico, jaguars occur from the rugged barrancas connecting northern Sinaloa and Sonora north, including eastern Chihuahua, to the border with the U.S. The most northern population of jaguars reported by Brown and Lopez-Gonzalez (2001) is in the area of the towns of Huasabas and Sahuaripa, about 130 miles (210 kilometers) south of the United States-Mexico border.

Recently (1996 through 2007), four individual male jaguars have been documented in the United States. One was observed and photographed on March 7, 1996, in the Peloncillo Mountains in New Mexico near the Arizona border (Glenn 1996, Brown and Lopez Gonzalez 2001). The Peloncillo Mountains run north-south to the Mexican border, where they join the foothills of the Sierra San Luis and other mountain ranges connecting to the Sierra Madre Occidental. Another was observed and photographed on August 31, 1996 in the Baboquivari Mountains of southern Arizona (Childs 1998, Brown and Lopez Gonzalez 2001). In February 2006, another jaguar was observed and photographed in the Animas Mountains in Hidalgo County, New Mexico.

From 2001 to 2007, two jaguars have also been repeatedly photographed using infra-red camera traps in south-central Arizona, near the Mexico border, including repeat occurrences of two individuals, one of which, "Macho B" was the male observed and photographed in 1996 in the Baboquivari Mountains. More specifically, these jaguars were documented in three different mountain range complexes in southeastern Arizona, over an area extending from the U.S./Mexico border north 47 mi and 39 mi east to west (McCain and Childs, in review). Jaguars were found using areas from rugged mountains at 1,577 m (5,174 ft) to flat lowland desert floor at 877 m (2,877 ft.) (McCain and Childs, in review). Most jaguar detections occurred in Madrean oak woodland communities; however, jaguars were also documented in open mesquite grasslands and desert scrub/grasslands on the desert valley floor. McCain and Childs (In review) were not able to use camera trapping techniques in open valley bottoms due the open expanses and lack of landscape features to direct or funnel wildlife movements and consequently could not determine the extent open areas are used by jaguars in Arizona. They report, however, the jaguars must at least cross the open valleys between mountain ranges, approximately 37 miles apart. Though more information on movement and distribution patterns needs to be gathered on jaguars in the borderlands region of Arizona, New Mexico, Sonora, and Chihuahua, it is believed that the males recently documented in Arizona and New Mexico likely interact with or are part of a jaguar population in northwestern Mexico.

Though maintenance of jaguar populations in Arizona may not be critical to the continued survival of jaguars throughout their range (71 FR 39335), loss of all potential jaguar habitat in Arizona (through severing jaguar movement corridors between Sonora and Arizona) could adversely affect northern jaguar population, one of eight high priority regions for the conservation of jaguars in Mexico (Chavez and Ceballos 2006). Hatten et al. (2002) identified 21 to 30 percent of Arizona ($62,000-88,580 \text{ km}^2 / 23,940-34,200 \text{ mi}^2$) as potentially suitable jaguar habitat. Based on a Genetic Algorithm for Rule-Set Production (GARP) model, Chavez and Ceballos (2006) reported that jaguars are likely currently distributed throughout about half of Sonora (or about $92,000 \text{ km}^2 / 35,520 \text{ mi}^2$). The Wildlands Project identified about 1/3 of Sonora ($55,480 \text{ km}^2 / 21,420 \text{ mi}^2$) as either an area where a jaguar base population or jaguar corridors occur. Sanderson et al. (2002) reported the size of the Jaguar Conservation Unit in the Sierra Madre Occidental of Sonora and Chihuahua (the most northern unit identified as being important for conservation of the species) as $5,200 \text{ mi}^2 (13,859 \text{ km}^2)$. These four maps were created using different criteria and thus cannot be directly compared; however, it is clear that the amount of potential jaguar habitat in Arizona represents about as much or more of the area where jaguars are currently distributed in Sonora. This area in Arizona could become increasingly important to the survival of the jaguar as threats (i.e., poaching, land conversion, etc.) continue in Sonora and throughout the range of the jaguar.

Furthermore, conservation of species at the periphery of their historical geographical range may be more important than previously believed (Lomolino and Channell 1995, Channell and Lomolino 2000). Miller et al. (1996; as cited in Johnson et al. 2007) established the value of peripheral populations in recovery of the black-footed ferret, as did Schaller (1993 as cited in Johnson et al. 2007) for the giant panda. Ehrlich and Ehrlich (1992 as cited in Johnson et al. 2007), Garcia-Ramos and Kirkpatrick (1997 as cited in Johnson et al. 2007) affirmed the conservation value of populations at the fringe of the range in a more general sense. Taking these reports into consideration, conservation of jaguars in their northern-most portion of their range (i.e., the northern population), though perhaps not critical, may be important to the long-term survival of jaguars, particularly the northern jaguar.

Abundance and population trends for the jaguar are still not well known, however, populations throughout their range continue to be at risk from hunting, over harvesting of potential jaguar prey, and habitat loss, fragmentation, and modification. Chávez and Ceballos (2006) estimated that: 60 percent of the jaguar's historical range in Mexico had been lost; the nationwide population was less than 5,000 individuals; and a variety of threats suggested that, absent effective conservation efforts, jaguar imperilment in Mexico would only worsen.

Life history of the jaguar is described above in the Status of the Species. Some life history elements, such as diet, vary throughout the jaguar range; however, generally, they are similar.

In 1997 AGFD and NMDGF entered into the Jaguar Conservation Agreement with other state, local, and Federal cooperators, with voluntary participation by many private individuals and thereby formed the Jaguar Conservation Team (JAGCT), to contribute to conserving the jaguar of Arizona and New Mexico and to encourage parallel efforts in Mexico. The Jaguar Conservation Agreement provides opportunities and incentives for interested parties to become involved with conservation activities. These activities include collection of biological information (to provide a sound scientific basis for decisions); consideration of relevant cultural, economic, and political factors; design and implementation of a comprehensive approach to conservation (including public education); and monitoring, evaluation, and feedback. In addition to an over-arching Memorandum of Agreement among the signatories, the Conservation Agreement embraces two main components. The first is a Conservation Assessment, which describes the status of the jaguar in the United States and identifies threats to the jaguar in Arizona and New Mexico. The assessment focuses the second component, the Conservation Strategy, on reducing or eliminating threats in Arizona and New Mexico that might prevent expansion of the current range and distribution of the jaguar, and thus contribute to recovery of the species (Van Pelt 2006).

The Jaguar Conservation Team has made several conservation-related accomplishments, including: (a) collaboration with Mexico on jaguar conservation; (b) a jaguar-based educational curriculum (in Spanish and English) that meets State and National standards and is in use in area schools; (c) enhanced public awareness of jaguar presence and conservation needs; (d) increased penalties under state law for unlawful killing of jaguars (in AZ these increased penalties apply only if the jaguar is delisted federally); (e) a jaguar detection project (using still and video "camera traps"); (f) a system for evaluating and archiving sighting reports; (g) GIS-based

evaluations of areas and habitats of historical and recent jaguar occurrence in Arizona and New Mexico for delineation of primary emphasis areas in both states for this conservation effort; (h) delineation of research recommendations intended to guide studies and provide JAGCT with information requisite to science-based conservation efforts; (i) a rural outreach program (see: Rinkevitch and Bashum 2002, Warshall and Bless 2003 as cited by Johnson et al. 2007); and (j) regular public forums in Arizona and New Mexico for discussion of jaguar-related issues (Johnson et al. 2007)

Mexico considers the jaguar a national priority species for conservation (DOF 1999, INE 2000 as cited in Johnson et al. 2007). In 2005, Mexico, under direction of CONANP (Comisión Nacional de Áreas Naturales Protegidas, the National Commission for Protected Natural Areas) and auspices of SEMARNAT, sponsored its first national symposium on jaguar conservation, *El Jaguar Mexicano en el Siglo XXI: Situación Actual y Manejo* (Chávez and Ceballos 2006). CONANP recognizes the value of conservation strategies, known in Mexico as PREPs (Proyectos de Recuperación de Especies Prioritarias), for diverse species and the need to identify threats to species and prioritize consensus actions, set specific dates, and establish clear goals, indicators of success, responsible parties, resources, and follow-up to implement actions for conservation. CONANP's *National Technical Consultants Subcommittee for Conservation and Management of the Jaguar* completed a PREP for jaguars in Mexico in 2006 (Ceballos et al. 2006 as cited by the Johnson et al. 2007). Direct actions would include protection, management, and restoration of the species and its habitat. Indirect actions would include information dissemination, integrating jaguar conservation into the existing fabric of local cultures, and administration, all in an Action Plan for jaguar conservation over a five-year period.

State-specific jaguar conservation strategies have been produced for Jalisco, Michoacán, and Oaxaca, but not for Sonora or Chihuahua. In 2006, a workshop was conducted by the National Institute of Ecology with the goal of developing a plan that will lead to recovery of the jaguar in Mexico. Key objectives were to evaluate the current status of the jaguar in Mexico; determine threats to jaguar existence; and determine priority conservation actions at the local, regional, and national scale. Subcommittees were established to work at the local level, including one for the northern jaguar population in Chihuahua and Sonora (Johnson et al. 2007).

Also in 2006, Mexico hosted a jaguar population and habitat viability analysis (PHVA) workshop, in Cuernavaca, Mexico. The workshop was the second element of the Simposio *El Jaguar Mexicano en el Siglo XXI*, and more workshops are anticipated. The overall process is intended to generate extinction risk assessments based on information on life history, population dynamics, ecology, and history of the populations. The PHVA 2006 workshop underscored the need to develop regional jaguar management (conservation) plans, including one for the Sonora-Sinaloa region (Johnson et al. 2007).

The Wildlife Conservation Society held a workshop in 1999 during which 51 Jaguar Conservation Units (throughout the entire range of the jaguar) were identified as being important for conservation of the species (Sanderson et al. 2002). The most northern of these units occurs in the Sierra Madre Occidental of Sonora and Chihuahua. Chávez and Ceballos (2006) report that at least eight high-priority regions for the conservation of jaguar exist in Mexico; the most northern of these regions is northwest Sonora. All regions, with the exception of two (one in

Nayarit and the other Jalisco) are generally large enough to maintain populations of 100 or more animals.

In addition to the above jaguar conservation planning efforts in Mexico, some reserves have been established to conserve habitat for jaguars and other species. For example, in 2004 Naturalia and the Northern Jaguar Project (NJP) purchased a 10,000-acre ranch, Rancho Los Pavos, in northern Sonora for the conservation of jaguars and other species. Additionally, Naturalia and NJP are in the process of purchasing a 35,000-acre ranch, Rancho Zetasora, located adjacent to the existing jaguar reserve, for the purpose of jaguar conservation (Northern Jaguar Project 2007).

A number of threats contributed to or continue to affect the status of northern jaguar populations, including illegal shooting; over hunting of jaguar prey species; and habitat loss, fragmentation, and modification. Most loss of occupied range has occurred in the southern United States, northern Mexico, northern Brazil, and southern Argentina (Sanderson et al. 2002).

Medellin et al. (2002) report that loss, fragmentation, and modification of jaguar habitat have contributed to population declines throughout much of the species' range, including northern Mexico. These changes in jaguar habitat have affected not only habitat for breeding and foraging, but also movement corridors. Rosas Rosas (2006) reported that jaguar habitats were degraded and conflicts between jaguars and human interests were common in Sonora. Furthermore, he reported illegal hunting of jaguars and their potential prey species and habitat fragmentation are probably the main threats to long-term conservation of jaguars in their northernmost western range.

Some threats (i.e., legal or illegal killing of jaguars) that contributed to the historical decline of the jaguar in the U.S. have been reduced or eliminated, however, other threats exist. For example, development of infrastructure projects (i.e., vehicle barriers, pedestrian fences, etc.) along the U.S. border may impede movement of jaguars across the border. Because jaguars in Arizona are believed to be part of a population in northern Mexico, preventing jaguar movement and exchange between the U.S. and Mexico would likely have deleterious effects on jaguars, particularly those in Arizona and New Mexico. Fences designed to prevent the passage of humans would also prevent passage of jaguars. However, the effect of permeable barriers, such as vehicle barriers, on jaguar movements is not known, though information suggests that they may also affect jaguars. The jaguar known as "Macho B" has not been documented near the border since temporary vehicle barriers were installed (E. McCain, Borderlands Detection Project, pers. comm., August 2007). It is not known if this avoidance is due to increased human presence, the vehicle barriers, or some other reason. Increased illegal and law enforcement actions along the Mexico-United States border may limit jaguar movement across the border and affect jaguar behavior, but the extent is not known.

No consultation has been completed for any Department of Homeland Security/Customs and Border Protection/Office of the Border Patrol actions that affect jaguars. Within the action area, DHS/CBP has constructed pedestrian fences on the U.S.-Mexico border in Nogales (about 4 miles), Naco (about 10 miles), and Douglas (about 10 miles). The December 2004, "Final Environmental Assessment for Temporary Vehicle Barriers, Tucson Sector" proposed the

installation of 37 miles of temporary vehicle barriers along the international border within the Tucson Sector (about from the Pozo Verde Mountains east, in a non-contiguous fashion, to just east of the Pima-Santa Cruz County line). However, the amount of temporary vehicles barriers that have been installed is unknown. Additionally, DHS/CBP has constructed an unknown amount of permanent vehicle barriers within the action area.

Two non-jeopardy opinions have been issued for actions that may affect jaguars. A biological opinion, issued September 26, 1997, addressed effects of the Bureau of Land Management Safford and Tucson Field Offices' Livestock Grazing Program in southeastern Arizona on the jaguar. Adverse effects to jaguars were expected to occur from the project by means of habitat loss and predator control activities. The anticipated level of take was considered to be exceeded if: 1) any predator control activities associated with the project are directed at, or ultimately result in death or injury of a jaguar; 2) the injury or mortality of any jaguar that occurs as a result of any activities associated with the project; and 3) jaguar habitat is not maintained in riparian corridors of the project area. Several conservation recommendations were also provided. Another biological opinion, issued June 22, 1999, addressed effects of the Nationwide Wildlife Services Program on the jaguar. Adverse effects to jaguars could occur from certain animal damage control methods, including the use of leg-hold and box traps, snares, M-44s, etc. The anticipated level of take was considered to be exceeded if animal damage control activities are directed at jaguars, or if one jaguar is unintentionally trapped, injured, or killed. We are not aware of any incidental take attributable to activities associated with either of the aforementioned programs.

Lesser long-nosed bat

All of the Tucson Sector's stations have vegetation communities that are considered lesser long-nosed bat foraging habitat, and many known day roost sites are located within the action area. Confirmed observations of lesser long-nosed bats have occurred in the Tucson, Nogales, Naco, and Douglas stations' AOs. In the Tucson Station's AO, lesser long-nosed bats have been documented roosting in the Baboquivari and Pozo Verde mountains along the western boundary of the station's AO. Several known roost sites, (including the Cave of the Bells), are located within the Nogales Station's AO in or near the Santa Rita, Pajarito, and Patagonia mountains. The State of Texas Mine is one known lesser long-nosed bat roost site located within the Naco Station's AO; this mine is not considered a maternity roost site. Roost sites in the Naco Station AO are also documented in the Dragoon Mountains, and along the San Pedro River. Lesser long-nosed bats have been documented roosting in the Chiricahua Mountains and south of the Peloncillo Mountains in the Douglas Stations AO. No maternity roosts are located within the action area.

Although no record of such activity exists, it is possible that OBP agents could track UDAs into a roost site during foot pursuits. Such activities could cause disturbances to lesser long-nosed bats and disrupt normal behavior activities. The magnitude of these effects would depend upon the proximity of these activities to roost sites, and the time (day/night and season) of the disturbance. Agents entering known roost sites during the day from April through October would be expected to disturb, and most likely affect, this species. OBP agents would only enter these areas when UDAs have been observed or tracked to the mine or cave and, in which case,

human disturbance has most likely already occurred. However, additional disturbance could cause additional effects.

EFFECTS OF THE PROPOSED ACTION

“Effects of the action” refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action (50 CFR §402.02). Indirect effects occur later in time but are reasonably certain to occur. “Interrelated actions” are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration (50 CFR §402.02).

Direct Effects

The proposed action described in this BA would result in direct impacts to 225 acres of vegetation and wildlife habitat within the three-county area. In addition to habitat-related effects described above, all CBP actions have the potential for disturbance to individuals of many of the animal and plant species that can include behavioral changes, interference with habitat use, and actual mortality of individuals. Construction, maintenance, or operations in or next to occupied (seasonally or permanently) habitats can displace individual animals from suitable habitat due to disturbances from human presence, noise, and changes in the amount of artificial light present during the normally dark hours.

Construction of new tactical infrastructure has effects related to ground or surface disturbance for the infrastructure and the construction operations. The direct footprint for the infrastructure results in ground disturbances, vegetation removal, soil compaction, interruption of washes or conveyance of sheetflow across open landscapes that can contribute to erosion in the footprint and surrounding areas, and it may create a barrier to wildlife movement. Construction of infrastructure in areas without existing access roads also opens up that area to additional access, including that from subsequent maintenance and law enforcement operations, access by the public, and illegal use. Areas with denser vegetation, particularly riparian areas, would require removal of vegetation for the placement and operation of facilities, including provisions for line-of-sight observations from sensor or surveillance posts.

Indirect Effects

On the larger scale, border security programs have both localized and regional consequences. Increased border security infrastructure and patrol operations in one location result in the movement of undocumented aliens (UDAs) to other areas where the chance to cross into the United States is greater. Environmental damage to natural resources from UDA traffic is considerable and affects large areas of many sensitive species habitats, and likely individuals of those species. Individual project planning on one location has not generally considered the effects of moving the UDA traffic to another portion of the border. The piecemeal approach to border security facility construction and intensity of patrol activity has affected isolated and sensitive areas not formerly utilized to any extent by UDAs. On a more local level, placement and design of fences and surveillance activities may also direct UDA traffic away from the current project. Protections for species undertaken at the new infrastructure location protect and benefit those species while contributing to adverse effects elsewhere. It is difficult to precisely predict future movement patterns of UDAs when passage through one corridor becomes difficult; however, a reasonable estimate of those future routes can be hypothesized for the purposes of effects analysis.

Jaguar

Direct Effects

The proposed action would permanently remove 225 acres of desert scrub and desert grassland communities. In addition, some riparian vegetation would be removed at the major washes. Washes and riparian vegetation provides value as movement corridors for the jaguar. Human activity and elevated noise levels would disturb any jaguar in the immediate area during the construction period, and possibly hinder or impede jaguar movement into the U.S.

Indirect Effects

Pedestrian fences that are designed to prevent illegal pedestrians from entering the U.S., will inherently restrict jaguar movement across the border. Maintaining connectivity between Arizona and Sonora is critical to the continued persistence of jaguars in Arizona. Should all jaguar movement corridors be compromised, it is possible that the jaguar will become extirpated from Arizona, as it is believed the existence of jaguars in Arizona relies on interchange with jaguars in Sonora.

The fence will block jaguar movements across the border in the areas it is constructed, as jaguars are unlikely to jump over the 15 to 18-foot fence; and because the fence will be impermeable to humans, jaguars will also be prevented from going through the fence. There are not likely to be any gaps in the fence. However, at either end of the proposed fence corridors (Sasabe east and west, west of Nogales fence, at the San Pedro River), jaguars could continue to move around the ends of the fence, although the extent to which they will do so is unknown.

This additional travel time would require jaguars to expend additional energy and increase the potential for encounters with humans, vehicles, and other stresses. The ends of the Sasabe fence

are in an open landscape that jaguars could move through. The western end of the Nogales fence is on the Coronado National Forest, and a jaguar could move through that area. The western end of the fence in the Naco AO ends at the San Pedro River, which a jaguar could use. However, because of the human use and exurbanization there, the likelihood that a jaguar would move through the San Pedro is low. The other fence segments in the Naco and Douglas AOs tie into existing pedestrian fence.

Installation of the fence may cause an increase in illegal traffic and subsequent law enforcement activities to the east and west of the Sasabe fence; both of which are important jaguar habitats where the species has been documented recently. Increased illegal and law enforcement activities in these areas may impede jaguar movement across the border and result in general disturbance to jaguars and degradation of their habitat. The increased law enforcement presence is likely to reduce illegal traffic at some later time.

Vehicle traffic, foot traffic, litter, and presence of illegal entrants can affect habitat by altering composition, structure, and function of wildlife habitats. Vehicle and foot traffic can lead to the destruction of vegetation and degradation of riparian, wetland, and other sensitive habitats. This habitat alteration can lead to alteration of erosion patterns and changes in habitat conditions such as light, temperature, and humidity. Litter and the presence of UDAs can alter the behavior (i.e., foraging, predatory, and plant dispersal behaviors) of sensitive wildlife, such as jaguars. Accidental wildfires caused by UDAs have had devastating effects in native habitats not adapted to a regular fire regime and can encourage the invasion of invasive species that reduce habitat quality.

In the long-term, however, the jaguar could incur some indirect beneficial effects from the proposed action by the reduction of illegal traffic and OBP enforcement actions. By reducing or eliminating these activities, the jaguar could use the Parilla, Huachuca, Mule, and Peloncillo mountain ranges and the Santa Cruz, San Rafael, and San Pedro River riparian areas as travel corridors.

The proposed conservation measures are designed to minimize and mitigate the effects of the action. The survey and monitoring component may provide basic information on jaguar locations and movements, and it may also answer management questions: 1) does UDA traffic impact jaguar habitat utilization and movement and 2) what types of effects do different kinds of border barriers, roads, and other infrastructure have on jaguar habitat use and movement? The conservation and recovery actions will improve the conservation status of the jaguar.

Conclusion

Pedestrian fences designed to prevent UDAs from entering the U.S. will inherently restrict jaguar movement across the border. Maintaining connectivity between Arizona and Sonora is critical to the continued persistence of jaguars into Arizona. Should all jaguar movement corridors be compromised, it is possible that the jaguar will become extirpated from Arizona, as it believed the Arizona population relies on interchange with jaguars in Sonora for its continued survival.

As discussed above, the proposed fences would preclude jaguar movement into the U.S. , especially the Sasabe fence. Jaguars could circumvent the ends of the fence; however, this additional travel time would require jaguars to expend additional energy and increase the potential for encounters with humans, vehicles, and other stresses.

Installation of the fence may cause an increase in illegal traffic and additional law enforcement activities to the east and west of the Sasabe fence; both of which are important jaguar habitats where the species has been recently documented. Increased UDA and law enforcement activities in these areas may impede jaguar movement across the border and result in general disturbance to jaguars and degradation of their habitat. The increased law enforcement presence is likely to reduce illegal traffic at some later time.

Though maintenance of jaguar populations in Mexico is likely essential for the continued survival of jaguars in the U.S., the opposite case is not likely valid. We reported in our critical habitat finding (71 FR 39335) that the areas where jaguars are occasionally seen in the U.S. are at the extreme northern limits of the range of the species, and the best available scientific information suggests that no area within the United States is currently critical for the survival of the species (Rabinowitz 1997, 1999). The area in the United States that is sporadically used by jaguars is only a small part of the range of the northernmost population(s), which is based in Mexico, and appears to be less than one percent of the current range of the species (Wildlife Conservation Society 2006). Because the area used by jaguars in the United States is such a small part of the overall range of the species and because of nomadic use by jaguars, the range of the jaguar in the United States is not enough area to provide for the conservation (i.e., recovery) of the jaguar or even make a significant contribution to the conservation of the jaguar, and it cannot be defined as essential to the conservation of the species. However, maintenance of existing jaguar habitat and movement corridors in the southwest U.S. and northwestern Mexico would facilitate the conservation of the northern jaguar population, as well as jaguars throughout their range. Any conservation actions for the jaguar that may bring the species to the point that the measures of the Act are no longer necessary will need to be implemented in Mexico and Central and South America. Thus, recovery of the species as a whole depends on conservation efforts in Mexico and Central and South America (71 FR 39225).

Although the construction of the pedestrian fence will adversely affect the jaguar, based on information provided in the status of the species, baseline, and effects, would not appreciably reduce the likelihood of both the survival and recovery of the jaguar because there is no known breeding in the United States. Also, only four jaguars have been documented in the U.S. since 1996; and the U.S. is a small portion of the overall range of the species.

The conservation measures proposed by CBP will help in minimizing impacts to jaguars and their habitat, and assist in improving the species' status. The survey and monitoring conservation measure not only provides basic information on jaguar locations and movements, it also answers management questions: 1) does UDA traffic impact jaguar habitat utilization and movement and 2) what types of effects do different kinds of border barriers, roads, and other infrastructure have on jaguar habitat use and movement? The conservation and recovery actions will improve the conservation status of the jaguar on the northern population. These conservation measures would partially implement the recommendations of the Jaguar Conservation

Assessment (Johnson et al. 2007).

Lesser long-nosed bat

Direct Effects

According to USACE, the proposed project would result in the disturbance of about 215 acres of potential lesser long-nosed bat foraging habitat, nearly all of which is immediately adjacent to the international border. The 215 acres of disturbed ground will be susceptible to colonization by invasive exotic plants such as buffelgrass. Exotic species may prevent the recruitment of lesser long-nosed bat forage species (columnar cacti and agaves) and may also carry fire that could also impact lesser long-nosed bat forage species. Most Sonoran Desert trees, shrubs, and cacti are very fire intolerant. Disturbance to vegetation will be minimized to the extent practicable. The disturbance will occur within areas that have mostly been previously disturbed.

The proposed action would permanently alter vegetation communities in the late-summer range of the lesser long-nosed bat. Agaves, the primary forage species during late summer, are not common within the project corridor, but do occur in unknown numbers. Saguaros are also not common in the project corridor. Agaves flower during the late summer when the lesser long-nosed bat migrates into areas near the project corridor. The proposed project will result in destruction of lesser long-nosed bat food plants; however, as stated in the proposed action, agaves will be salvaged (removed and replanted outside the project corridor) at a 2:1 ratio.

Destruction of and damage to lesser long-nosed bat forage plants and disturbance of potential bat foraging habitat will reduce food available to the lesser long-nosed bat; especially in drought when forage availability is already impaired. It is difficult to evaluate the significance of the loss of foraging habitat; however, this loss is small compared to the large amount of potentially suitable foraging habitat available to the lesser long-nosed bat throughout the action area.

Indirect Effects

Impacts to vegetation communities resulting from UDAs circumventing the pedestrian fence would also indirectly affect the lesser long-nosed bat by impacting forage plants. The preferred foraging communities of the lesser long-nosed bats in the action area are more common at the higher elevations where agaves occur, which is also where these impacts are more likely to occur. Trails and other soil disturbances can increase erosion, promote the spread of invasive species, and increase the potential for fires. The proposed action would reduce the current level of impacts resulting from illegal traffic in these vegetation communities immediately north of the pedestrian fence. Impacts to larger roosts sites resulting from shifts in UDA activity would be minimal. There would be beneficial indirect impacts expected to roost sites, if UDA traffic and law enforcement activities are reduced.

Known maternity roosts are west of the range of potential impacts and would not be affected. The nearest known roosts of lesser long-nosed bats are near Patagonia, and on the Coronado National Memorial, about 24 miles northwest and 8 miles west of construction activities, respectively. There is evidence that UDAs have used the State of Texas Mine roost on the

Coronado National Memorial (USFWS files). UDAs also used the Bluebird Mine roost on Cabeza Prieta National Wildlife Refuge before it was fenced.

Conclusion

According to USACE, the proposed project would result in the disturbance of about 215 acres of potential lesser long-nosed bat foraging habitat, nearly all of which is immediately adjacent to the international border. The proposed action will permanently alter vegetation communities in the late-summer range of the lesser long-nosed bat. Though potentially all forage plants in the 60-foot construction corridor will be lost, they represent a small fraction of the forage plant within the action, and an even smaller fraction within the species' range.

The indirect effects to vegetation communities and lesser long-nosed bat forage plants resulting from UDAs circumventing the primary fence may also affect forage plants, though at an unknown, but probably minimal, level. Though the direct effects of construction will result in the destruction of lesser long-nosed bat food plants; CBP proposes to salvage (remove, replant, and replace outside the project corridor) at a 2:1 ratio.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation under section 7 of the Act.

The lands within the action area are primarily Federal and non-Federal rangeland. There are areas that are developed and used by people at varying intensities. The towns and cities of Sasabe, Nogales, Naco, and Douglas are in or very near the project corridor. In addition, other areas have exurban development, roads, and other infrastructure. The greatest area of exurban development is in the upper San Pedro valley.

Effects from future growth and expansion in Cochise County could also have adverse impacts on the jaguar movement corridors. Sierra Vista's population increased by 14.5 percent during the 1990s; and between 2000 and 2005, Sierra Vista's overall population growth of 15.7 percent outpaced that of Cochise County (City of Sierra Vista 2007). Sierra Vista's population in 2006 was estimated to be 44,870; an estimated growth of 2.7 percent from the year prior. The Cochise College Center for Economic Resources estimates that the population of Sierra Vista could reach 51,331 by 2011; a projected 5-year population growth of 14.4 percent. The current and projected growth of Sierra Vista and the expansion of housing and humans in rural and undeveloped areas could remove potential jaguar habitat; thus having additional effects on the jaguar. Also, continued growth in or near the project corridors will decrease their value as foraging habitat for the lesser long-nosed bat, and as movement corridors and habitat for the jaguar.

The activity of UDAs also causes cumulative effects. UDAs directly impact vegetation communities and the species that use them by creating tons of trash and hundreds of miles of illegal trails and roads. Trails and other soil disturbances can increase erosion, promote the

spread of invasive species, and increase the potential for fires. Fires can exacerbate the impacts from UDAs, with more erosion, invasion of exotic species, and a cascade of effects to watershed functioning.

SUMMARY

The environmental baseline shows that most of the construction footprint is modified, mostly by previous legal and illegal border activities. Both the lesser long-nosed bat and the jaguar could realize beneficial effects with the reduction of illegal traffic and consequent OBP pursuit within the areas north of the fence. The installation and maintenance of 31 miles of fence would hinder jaguar movement and remove lesser long-nosed bat forage species. The proposed action is also likely to result in increased UDA traffic and consequent OBP enforcement actions in higher quality habitat away from the fence. The direct impediments and the potential increased human activity in the normal travel corridors would adversely affect the ability of the jaguar to continue to enter the U.S. from its core population in northern Mexico. However, this impedance should not have a significant effect on the survival and recovery of the species, as the U.S. is a small portion of the overall range of the species. The loss of 215 acres of foraging habitat for the lesser long-nosed bat would adversely affect the bat although the loss would be insignificant compared to the availability of forage resources outside of the construction area. The conservation measures should minimize and mitigate the effects of the action on the bat and jaguar. The jaguar survey and monitoring component should provide basic information on jaguar locations and movements, and may also answer management questions. The conservation and recovery actions are expected to improve the conservation status of the jaguar. The conservation measure to replace lesser long-nosed bat foraging plants should minimize the impact from the loss of 215 acres of foraging habitat.

CONCLUSION

After reviewing the current status of the jaguar and the lesser long-nosed bat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the project, as proposed, is not likely to jeopardize the continued existence of the jaguar or the lesser long-nosed bat. Critical habitat has not been designated for either species; thus no critical habitat will be affected by the proposed action. We base our conclusion on the following:

- 1) The direct impacts are at the international border, thus they are limited to a relatively small area;
- 2) The construction period should be short (1-3 months), thereby reducing the potential impacts from human disturbance;
- 3) The conservation measures will reduce the impacts to lesser long-nosed bat forage resources by salvaging and replacing agaves at a 2:1 ratio;
- 4) Jaguars will still be able to move through other areas of the border;

- 5) Jaguars in Arizona represent a small, apparently non-breeding portion of the occupied range of the species;
- 6) Increased Border Patrol enforcement in the areas on both ends of the Sasabe fence should help reduce the effects of increased UDA traffic in areas used by the jaguar and lesser long-nosed bat;
- 7) The conservation measures for the jaguar should offset the effects of the pedestrian fences by answering management questions about how jaguars move on the landscape, and which areas they use in response to various barriers. The conservation measures will also improve the conservation status of the jaguar through proactive management actions (this may include purchase of jaguar habitat and/or conservation easements, as well as providing private-landowner incentives to maintain jaguar populations).

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act, prohibit take of endangered or threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. "Harm" is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the proposed action is not considered to be prohibited taking under the Act provided such taking is in compliance with this Incidental Take Statement.

Amount or Extent of Take

We do not anticipate the proposed action will incidentally take any lesser long-nosed bats or jaguars.

CONSERVATION RECOMMENDATIONS

Sections 2(c)(1) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

- 1) The Office of Border Patrol should assist with implementation of the lesser long-nosed bat recovery plan, where appropriate;
- 2) The Office of Border Patrol should assist with the implementation of the Jaguar Conservation Framework;
- 3) The Office of Border Patrol should participate on the Jaguar Conservation Team.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the proposed pedestrian barriers near Sasabe, Nogales, Naco, and Douglas, and their effects on jaguar and lesser long-nosed bat. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is later modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have questions regarding this Biological Opinion, please call Doug Duncan (520) 670-6150 (x236) or Sherry Barrett (520) 670-6150 (x223) of my staff. Please refer to the consultation number 22410-2007-F-0416 in future correspondence concerning this project.

/s/ Steven L. Spangle
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APPENDIX A

KEARNEY BLUE STAR

Status in Action Area

Kearney's blue star is known only from the Baboquivari Mountains in Pima County, Arizona. It occurs in South, Brown, and Thomas canyons. Kearney's bluestar in South Canyon on the Tohono O'odham Nation are thought by some to be extirpated, but we have no confirmation of this. In 1988, we contracted with Southwestern Field Biologists to conduct a transplant project for Kearney's bluestar in Brown Canyon. In 1988, 76 plants were transplanted, but high mortality necessitated another planting effort in 1989 with an additional 105 plants (AGFD 2003b). A large flood in June 1990 destroyed the plants and the habitat, with a loss of 75 percent of the transplants. The one native population consists of about 10 to 15 individuals (AGFD 2003b). The native population exists on the Tohono O'odham Nation, and the introduced sites exist on the Buenos Aires National Wildlife Refuge. The entire range of the species is in the project action area (USFWS 1989, 1993). The listing document (USFWS 1989) and recovery plan (USFWS 1993) are incorporated by reference.

Analysis of Effects

The major threats to the species seem to be heavy insect predation and watershed degradation associated with improperly managed livestock grazing or post-fire effects. Trails and the spread of invasive species may also threaten known and unknown Kearney's blue star populations. No direct impacts to Kearney's blue star population would occur from the proposed action since construction is not proposed near where the species occurs. Impacts to Kearney's blue star resulting from UDAs circumventing the primary fence would be indirect, but not likely to be adverse. Additional UDA foot traffic may move into the Baboquivari Mountains, closer to known populations of Kearney's blue star. Some traffic already occurs.

Conclusions

After reviewing the status of the Kearney's blue star, the environmental baseline for the action area, and the effects of the proposed action, the Service concurs that the proposed action may affect, but is not likely to adversely affect Kearney's blue star, based upon the following:

- The construction and direct effects covered in this consultation are not located in the area of these plants;
- Periodic monitoring occurs at the populations, allowing their status to be monitored;
- Decreases in UDA traffic may occur after the pedestrian barrier is constructed, since the fence should allow law enforcement to increase enforcement west of the barrier, and reduce UDA traffic there; and
- Conservation measures will be implemented to reduce adverse effects.