

SECTION 3.0
AIR QUALITY



3.0 AIR QUALITY

3.1 AFFECTED ENVIRONMENT

Air quality issues and conditions for the ROI were discussed in the 2004 TVB EA and most recently in the 2007 Road EA (CBP 2004, 2007b). Those discussions are incorporated herein by reference.

In summary, the U.S. Environmental Protection Agency (USEPA) Office of Air Quality Planning and Standards has set National Ambient Air Quality Standards (NAAQS) for six criteria pollutants. The major pollutants of concern, or “criteria pollutants,” are carbon monoxide, sulfur dioxide, nitrogen dioxide, ozone, suspended particulate matter less than 10 microns (PM-10), and lead. Areas that do not meet the NAAQS are called “non-attainment” areas; conversely, areas that meet both primary and secondary standards are known as “attainment” areas.

According to air quality information received from USEPA Region 9 during the development of the 2007 Road EA, unincorporated areas of Santa Cruz County are in attainment of established NAAQS for all criteria pollutants (CBP 2007b). However, the Nogales metropolitan area is currently in violation of the NAAQS for PM-10. The emission sources have been identified as unpaved roads, cleared areas, and paved roads (USEPA 2007).

3.2 ENVIRONMENTAL CONSEQUENCES

Although the Secretary’s waiver means that CBP no longer has any specific legal obligations under the CAA, for the TI segments addressed in this ESP, the Secretary committed the Department to responsible environmental stewardship of our valuable natural and cultural resources. CBP supports this objective and has applied the appropriate standards and guidelines associated with the CAA as the basis for evaluating potential environmental impacts and appropriate mitigations.

EPA’s NONROAD 2005 Model was used, as recommended by EPA’s *Procedures Document for National Emission Inventory, Criteria Air Pollutants, 1985-1999* (EPA 2001), to calculate emissions from construction equipment such as bulldozers, cranes, etc. Assumptions were made regarding the type of equipment, the total number of days each piece of equipment would be used, and the number of hours per day each type of equipment would be used.

Similarly, emissions from delivery trucks and commuters traveling to the job site were calculated using the EPA MOBILE6.2 Model (EPA 2001). Construction workers will temporarily increase the combustible emissions in the airshed during their commute to and from the project area. These emissions were calculated in the air emission analysis and included in the total emission estimates.

Furthermore, large amounts of dust (i.e., fugitive dust) can arise from the mechanical disturbance of surface soils, including grading, driving, and road and fence construction. Fugitive dust emissions were calculated using the emission factor of 0.11 ton per acre per month, which is a more current standard than EPA's 1985 *Compilation of Air Pollutant Emission Factors*, also known as AP-42 (EPA 2001). The total air quality emissions were calculated for the construction activities occurring in Santa Cruz County to compare to the General Conformity Rule. A summary of the total emissions for Santa Cruz County is presented in Table 3-1 and details of the analyses are presented in Appendix C.

Table 3-1. Total Air Emissions (tons/year) from Construction Activities for the Planned Action vs. de minimis Levels

Pollutant	Total (tons/year)	<i>de minimis</i> Thresholds (tons/year)
Carbon monoxide	28.62	NA
Volatile Organic Compounds	6.41	NA
Nitrogen oxides	54.55	NA
Particulate matter (< 10 microns)	14.22	100
Particulate matter (< 2.5 microns)	6.41	NA
Sulfur dioxide	6.53	NA

Source: 40 CFR 51.853 and GSRC model projections.

Based on these estimates, the fence and maintenance road construction will result in a minimal and temporary impact on local air quality. During construction, fugitive dust (PM-10) levels will increase in the ROI. However, fugitive dust generated during construction will be minimized by applying water or other wetting solutions as outlined in Section 1.5.2 of this ESP. As indicated in Table 3-1, the PM-10 emissions will be well below the *de minimis* thresholds. Therefore, no major long-term impact on air quality is expected. Conversely, ambient air quality conditions will most likely incur slight improvements due to a reduction of off-road IA traffic and consequent USBP enforcement actions.

SECTION 4.0
NOISE



4.0 NOISE

4.1 AFFECTED ENVIRONMENT

Ambient noise conditions within the project corridor were described in the 2004 TVB EA; the descriptions are incorporated herein by reference. Briefly, noise levels are generally computed over a 24-hour period and adjusted for nighttime annoyances to produce the day-night average sound level (DNL). DNL is the community noise metric recommended by USEPA and has been adopted by most Federal agencies (Federal Interagency Committee on Noise 1992). A DNL of 65 decibels A-weighted scale (dBA) is most commonly used for noise planning purposes and represents a compromise between community impact and the need for activities such as construction. Areas exposed to a DNL above 65 dBA are generally not considered suitable for residential use. The ambient noise levels within the project corridor are expected to be less than 55 dBA due to its remote location. Furthermore, there are no noise-sensitive receptors near the project corridor.

4.2 ENVIRONMENTAL CONSEQUENCES

Construction noise levels created by transport vehicles, portable light generators, and other construction equipment will vary greatly depending on climatic conditions, season, equipment type and model, and construction activity. Although increased noise levels will occur during construction activities, the project corridor is undeveloped and does not contain noise-sensitive receptors (e.g., hospitals, schools, residences). However, during transport operations via public roads and private access roads to and from the project corridor, temporary increases in vehicle-related noise levels will likely occur within residential areas. The potential for extended periods of noise levels above the DNL average will be minimized since transport operations will not occur on a daily basis. Rather, heavy equipment transport will occur intermittently, so that equipment and materials could be stockpiled. In order to further minimize noise increases, transport operations will also be restricted to daylight hours and weekdays, to the extent practicable, when the normal DNL averages are likely at the highest levels. Deviations from such a restricted schedule will be coordinated through Santa Cruz County Public Works Department-Transportation Division. As described in Section 8.2.2 of this ESP, potential impact on wildlife species due to increased noise levels will be temporary and minor.

Construction equipment and maintenance activities for the primary pedestrian fence road will periodically increase noise levels in the project corridor. However, upon completion of these activities, ambient noise levels will return to previous levels. Therefore, the impact will be temporary, localized, and negligible.

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SECTION 5.0
LAND USE, RECREATION AND AESTHETICS

5.0 LAND USE, RECREATION AND AESTHETICS

5.1 AFFECTED ENVIRONMENT

5.1.1 Land Use

The major land uses in the region include agriculture, range land, urban, forest, recreation or special use, water, and border security. Federal agencies that control large land areas in Santa Cruz County are USFS and BLM (Arizona Department of Commerce 2007). The major state agencies controlling large areas of land are Arizona State Land Department, Arizona Game and Fish Department (AZGFD), and Arizona State Parks. The remaining land ownership category includes land controlled by other Federal agencies, such as National Park Service (NPS), along with county and municipal lands.

Land within the project corridor is currently open cattle range land under private ownership. USBP routinely uses existing roads along the U.S./Mexico border as patrol roads, and maintains approximately 2.7 miles of intermittently positioned TVBs along the U.S./Mexico border to control illegal vehicle traffic. The USFS CNF is located at the eastern end of the D-6 segment. Land use on the CNF includes timber production, grazing leases, and recreation.

5.1.2 Aesthetics

Aesthetic and visual resources were discussed in the 2004 TVB EA and the discussion is incorporated herein by reference. Aesthetic and visual resources consist of the natural and man-made landscape features that give a particular environment its visual characteristics (see Photograph 5-1). The project corridor consists mostly of open areas with steep rolling hills and deep dissecting valleys covered by native grasses and other vegetation.



Photograph 5-1. A Typical View along the Eastern Portion of the Project Corridor

Background vistas outside of the city consist of distant views of the surrounding mountains. The ROI and the entire southern Arizona region are known for tranquil dark skies and scenic mountain ranges. However, trails, trash, and wildfires caused by

illegal traffic have degraded many areas. In addition, overgrazing has resulted in a diminished visual quality in several locations along the border.

5.2 ENVIRONMENTAL CONSEQUENCES

5.2.1 Land Use

The Planned Action will have a minor direct impact on land use, as 11 acres of private range land will be converted to TI and law enforcement zone. An additional 5 acres will be converted from public rangeland on the CNF to an access road. There will be a temporary direct impact on 26 acres of land used for equipment staging, but the land will return to its original functions following the construction period. Land will be acquired through lease, easement, or fee title to the government. Landowners will be compensated at fair market values.

Construction and operation of TI will increase border security in the project corridors and may result in a change to illegal traffic patterns. However, changes to illegal alien traffic patterns result from a myriad of factors in addition to USBP operations and therefore are considered unpredictable and beyond the scope of this ESP. Indirect beneficial impacts are expected as a result of decreased illegal traffic north of the project corridor. By reducing illegal traffic within and adjacent to the project corridor, damage to grazing lands north of the corridor is also expected to be reduced or possibly eliminated.

5.2.2 Aesthetics

The primary pedestrian fence will have a minor adverse impact on the visual qualities of the specific location where it is installed. Exhibit 5-1 provides a simple visual representation of what the project corridor may look like with primary fence constructed.

Exhibit 5-1. Digitally Enhanced Photo Representation of the Project Corridor at the Same Location as Photograph 5-1



While the addition of TI will have an adverse impact, the reduction or elimination of illegal foot traffic, which causes long-term changes to the environment, will benefit the region's appearance. A reduction of trash (as identified in Photograph 5-2) and wildfires set by IAs, will also be a benefit to the region's aesthetic values.



Photograph 5-2. Trash left behind by IAs, typical of the ROI

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SECTION 6.0
SOILS



6.0 SOILS

6.1 AFFECTED ENVIRONMENT

Eight soil associations are present within the project corridor, as described below. None of these soils are considered prime or unique farmland soil.

Chiricahua-Lampshire association. Chiricahua soils are on the smoother side slopes and saddles of granitic mountains. Slopes are 5 percent to about 15 percent. Lampshire soils are on the steeper, rockier parts. Slopes are short and as much as 45 percent. The surface is 35 to 50 percent gravel, 10 to 35 percent cobbles, and 0 to 5 percent stones.

Comoro-Pima association. The Comoro-Pima soil association consists of deep sandy loams and clay loams found on the Santa Cruz River floodplain; they comprise only 1 percent of the entire county and account for 10 percent of the project corridor. These soils formed in recent alluvium and tend to be more than 60 inches deep. They exhibit only a slight erosion potential, likely due to the low-lying areas in which they exist.

Graham soils, 5 to 20 percent slopes. The soils in this undifferentiated group are at the foot of basic igneous and tuffaceous mountains. Slopes are dominantly 5 to 20 percent. The surface layer of other Graham soils in this unit is gravelly or cobbly loam. The surface is 15 to 50 percent gravel, 0 to 25 percent cobbles, and a few stones.

Lampshire-Chiricahua association. The soils in this association are on granitic hills and low mountain uplands. They are about 60 percent Lampshire soils and 25 percent Chiricahua soils, although the percentage of each varies from place to place. Slopes range from 15 to 50 percent. Generally Lampshire soils are on steeper, rockier positions and have slopes of 30 to 50 percent. Chiricahua soils have slopes of 15 to 30 percent. The soils in this complex have profiles similar to those described as representative of their respective series, but the surface layer is cobbly or very cobbly sandy loam or gravelly or very gravelly sandy loam in places. Bedrock is granite, quartzite, or tuff-conglomerate. The surface is 35 to 60 percent gravel and 0 to 20 percent cobbles and stones.

Some areas exhibit as much as 50 percent Rock outcrop but averages about 10 percent. Small areas of gravelly alluvium occur in drainages; and small areas of shallow and very shallow soils that are similar to Lampshire soils are also included in this association.

Lampshire-Graham-Rock outcrop association. This association is about 35 percent Lampshire soils, 30 percent Graham soils and 30 percent Rock outcrop, but the percentage of each varies from place to place. Some areas consist mostly of one soil, or the other, and of 10 to 50 percent Rock outcrop. Slopes range from 20 to 60 percent. Lampshire soils are generally on the steeper, rockier positions and have slopes of 30 to

60 percent. Graham soils have slopes of 20 to 30 percent. Rock outcrop occurs at ledges and pinnacles and is dominantly of basic igneous composition. The surface is 10 to 25 percent gravel, to 20 to 50 percent cobbles, and 0 to 20 percent stones.

Rock outcrop. This miscellaneous land type consists mainly of areas of bare bedrock that commonly are nearly vertical rock ledges and pinnacles near mountaintops. Rock types are limestone, quartzite, quartz monzonite, rhyolite-tuff, andesite, and others. As much as 10 percent of the mapped area has shallow and very shallow soils between outcrops of rock. Slopes are dominantly more than 60 percent.

White House-Caralampi complex, 10 to 35 percent slopes. This complex consists of about 45 percent each White House and Caralampi soils. The soils are on long, narrow, roughly parallel, convex ridge remnants formed by deep dissection of old piedmont surfaces. White House soils are generally on the less sloping ridgetops and shoulders that have slopes of 10 to 20 percent. Caralampi soils are generally on the steeper portions that have slopes of 20 to 35 percent. The White House soils have a surface layer of gravelly, cobbly, very gravelly or very cobbly sandy loam or sandy clay loam and cobbly, very gravelly, or very cobbly loam. Gravelly sandy loam is most common. The surface is covered by 15 to 50 percent gravel and 0 to 20 percent cobbles.

White House-Hathaway association, steep. The soils in this association are on ridge remnants of severely dissected old piedmont surfaces. White House soils make up about 45 percent of the association, and Hathaway soils about 30 percent. White House soils commonly have slopes of 5 to 15 percent. Hathaway soils are commonly steeper, having slopes of 20 to 45 percent. The surface is covered by 15 to 50 percent gravel, 0 to 15 percent cobbles, and a few stones.

6.2 ENVIRONMENTAL CONSEQUENCES

Soil disturbance required under the Planned Action will permanently remove 116 acres from biological production, primarily from three associations: (1) White House-Hathaway (36 acres), (2) White House-Caralampi (24 acres) and (3) Lampshire-Graham-Rock outcrop (23 acres). These three associations comprise 72 percent of the project footprint. The Lampshire-Chiricahua association will incur a loss of 11 acres, but less than 8 acres of each of the remaining soil associations will be impacted.

An additional 26 acres of Caralampi-White House-Hathaway soils located within temporary staging areas will likely be scraped and bladed to accommodate material staging. Upon completion of construction activities, the soils will be stabilized and allowed to re-vegetate, resulting in only minor temporary impact. These soil associations comprise a small percentage of soils existing within Santa Cruz County and none are considered prime farmland soils; thus, there will be only a negligible adverse impact to the region's soils.

A SWPPP will be prepared and implemented by the construction contractor, which will identify BMPs to minimize or prevent erosion and downstream sedimentation during and after construction.

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SECTION 7.0
HYDROLOGY AND GROUNDWATER



7.0 HYDROLOGY AND GROUNDWATER

7.1 AFFECTED ENVIRONMENT

7.1.1 Groundwater

The groundwater resources of Santa Cruz County were discussed in detail in the 2004 TVB EA; the discussion is incorporated herein by reference (CBP 2004a). Groundwater resources affected in the project corridor are located in the Santa Cruz Active Management Area (AMA) (Arizona Department of Water Resources [ADWR] 2007). This AMA consists of 716 square miles located in the Basin and Range physiographic province and includes groundwater and surface water resources in the Santa Cruz River Valley. Water quality assessments for the affected region indicate that the major causes of surface water non-attainment include heavy metals, ammonia, low dissolved oxygen, turbidity, total dissolved solids, and fecal coliform bacteria. Groundwater resources in the Upper Santa Cruz River Valley form three aquifer units: the Nogales formation, older alluvium, and younger alluvium (ADWR 2007). According to the ADWR Third Management Plan (1999), the average total recharge within the Upper Santa Cruz AMA was approximately 98,800 acre-feet per year. In 1995, the total use of groundwater within the AMA by the municipal, agricultural, and industrial sectors totaled approximately 21,000 acre-feet. The projected withdrawal of groundwater from the Santa Cruz AMA for year 2010 is 56,100 acre-feet (ADWR 2007); thus, the recharge in the Upper Santa Cruz AMA exceeds the withdrawal from the aquifer. Sustained yield management of water resources within the AMA includes plans for greater use of effluent as recharge so the reserve of good-quality water is preserved.

7.1.2 Surface Waters and WUS

The Santa Cruz River is the primary surface waterway influencing the project corridor and ROI. The Santa Cruz River is characterized as an intermittent stream that contains perennial and effluent dominated reaches. Within the project corridor and ROI, it is considered a perennial stream. The river flows south into Mexico from its head waters in the San Rafael Valley, located approximately 15 miles east of the project corridor. From Mexico, it meanders back northward and re-enters Arizona 5 miles east of Nogales, within the project corridor, at which point the river continues northward toward Tucson, Arizona.

Water supply and quality issues for this river system were described in detail in the 2004 TVB EA; that discussion is incorporated herein by reference (CBP 2004a). In summary, elevated levels of turbidity, copper, and cadmium have been documented as issues of concern between the U.S./Mexico border and the Nogales Waste Water Treatment Facility in Nogales, Arizona (USEPA 2004a). The river typically supports most uses within the ROI; however, aquatic ecosystems and warm water fisheries are only partially supported (USEPA 2004a and 2004b).

Recent pedestrian surveys of the project corridor, conducted February 14 through 17 and April 23 and 24, 2008, identified 27 potential surface water crossings, that bisect

the project corridor. Figure 7-1 identifies all of the potential surface water crossings located within the project corridor. All of these streams would likely to be classified as jurisdictional WUS under the CWA. Appendix D is the Biological Field Report which discusses the results of the field surveys and identifies these stream crossings.

7.1.3 Floodplains

Construction activities that occur within the 100-year floodplain are typically regulated by the National Flood Insurance Act of 1968, as amended (42 USC 4001 et seq.), and the Flood Disaster Protection Act of 1973 (P.L. 93-234, 87 Stat. 975) and Executive Order (EO) 11988. These regulations are designed to reduce the risk of flood loss, minimize the impact of floods on human safety, health and welfare, and preserve the beneficial values which floodplains serve. While issuance of the waiver eliminated the requirement for CBP to comply with these regulations, these standards have been used to evaluate the potential impacts to floodplains associated with the fencing projects in Arizona and to develop BMPs, if necessary, to minimize those impacts.

According to the Federal Emergency Management Agency (FEMA) floodplain maps (FEMA 1981), approximately 1,510 linear feet of the project corridor, specifically the Santa Cruz River floodplain, are bisected by a jurisdictional floodplain (Figure 7-2).

7.2 ENVIRONMENTAL CONSEQUENCES

Although the Secretary's waiver means that CBP no longer has any specific legal obligations under the CWA and EO 11988, for the TI segments addressed in this ESP, the Secretary committed the Department to responsible environmental stewardship of our valuable natural and cultural resources. CBP supports this objective and has applied the appropriate standards and guidelines associated with these regulations, as the basis for evaluating potential environmental impacts and appropriate mitigations.

Water required for construction purposes (e.g., fugitive dust control and concrete pours) will be obtained from the City of Nogales municipal water supply and trucked to the project corridor. Depending on the method employed for fence construction, construction activities could require as little as 10,000 gallons of water per mile (dust suppression only) or up to 325,000 gallons per mile (equivalent of 1 acre-foot) for concrete footing, dust suppression, and limited soil compaction. These amounts will have a negligible to minor impact on the availability of water in the region. Since no more than 7.6 acre-feet of water will be required for construction (worst-case scenario), no major impact on regional groundwater supplies or quality is anticipated.

7.2.1 Surface Water and WUS

The Planned Action will have a minor, temporary impact on surface water resources in the form of sedimentation and erosion caused by construction. However, this impact will be minimized through the use of pre- and post-construction BMPs as specified in the SWPPP.

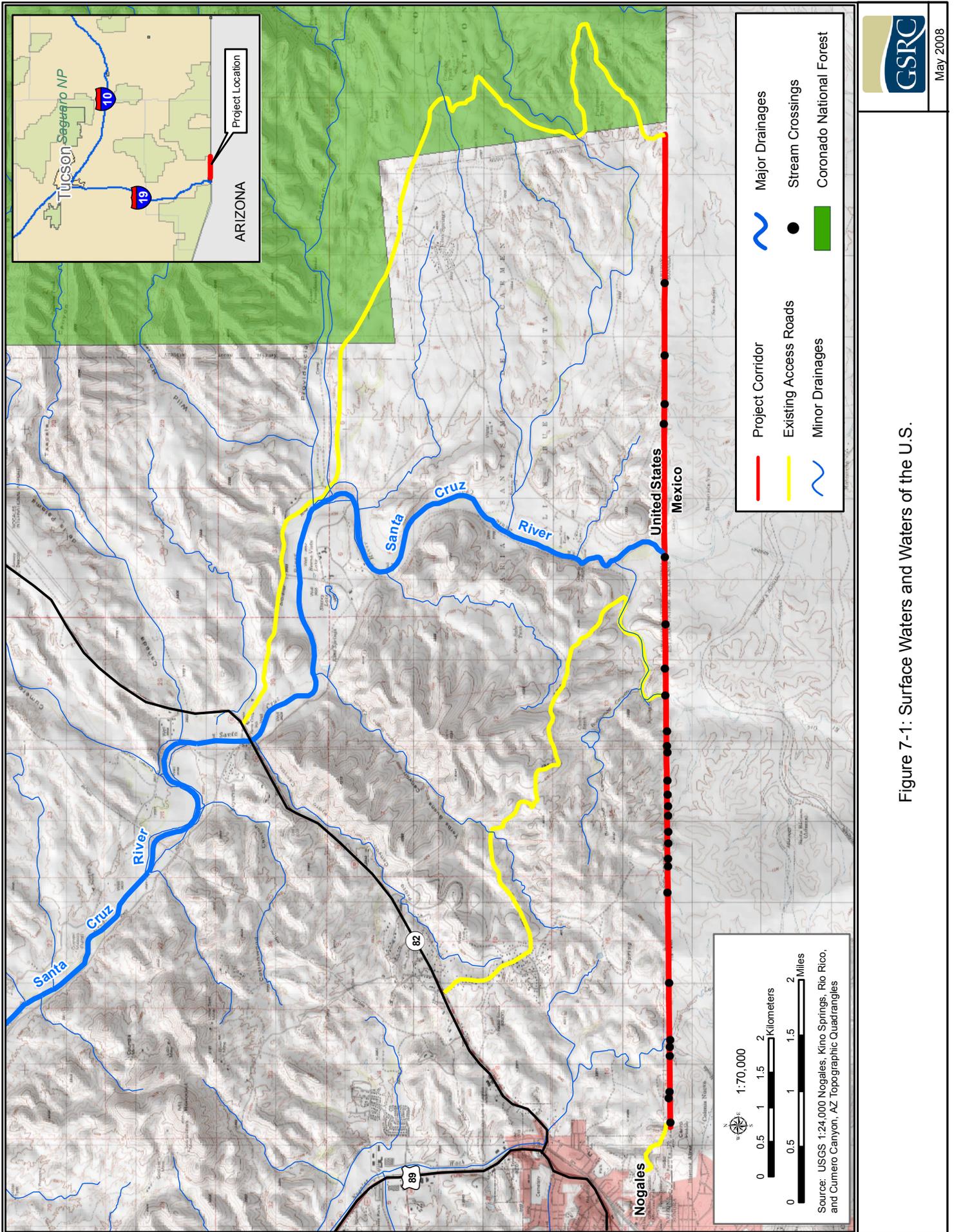


Figure 7-1: Surface Waters and Waters of the U.S.

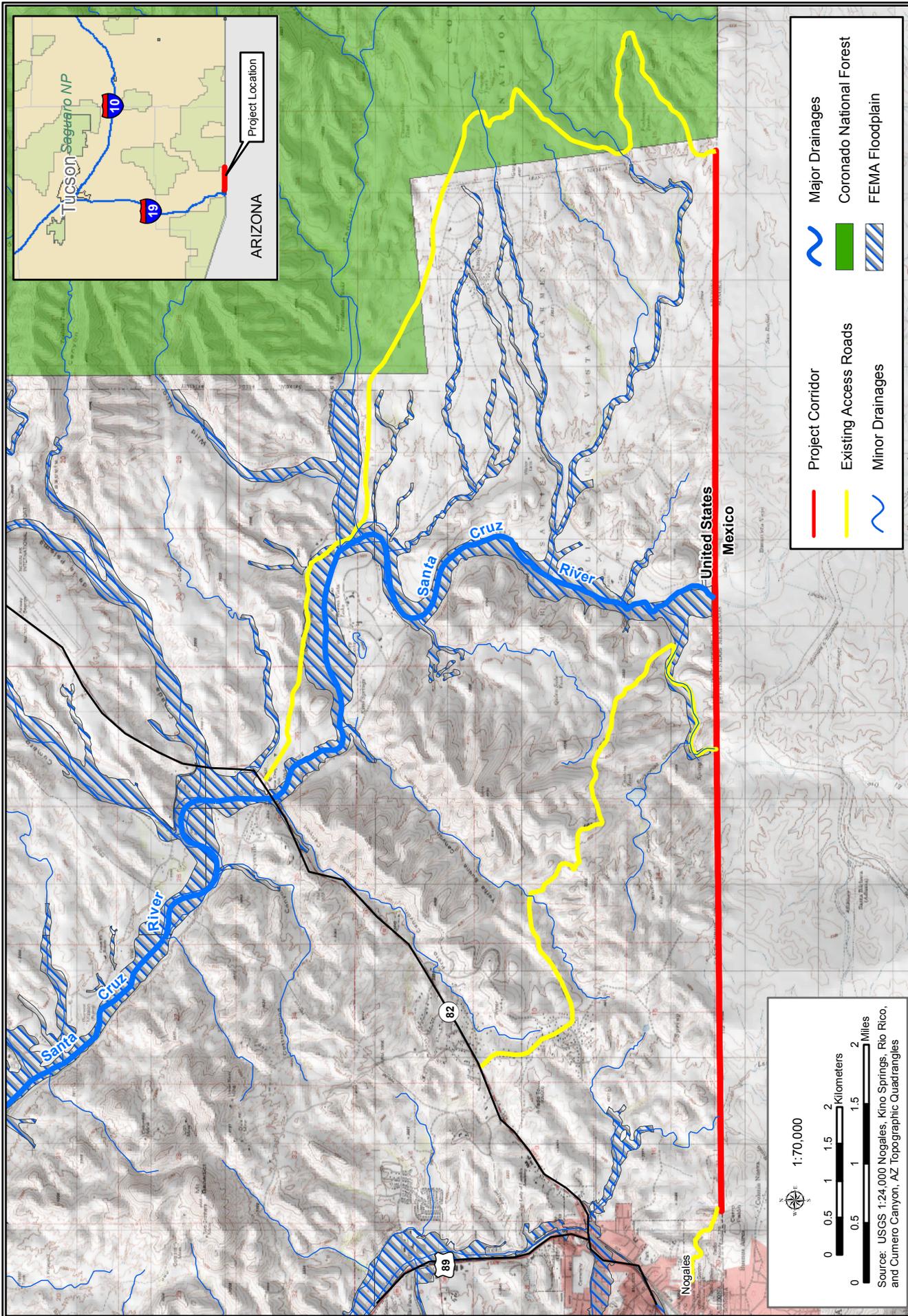


Figure 7-2: FEMA Floodplain Map

The construction of 7.6 miles of fence and patrol/maintenance road will impact 26 potentially jurisdictional WUS. The anticipated area of impact at each crossing is presented in Table 7-1, below.

Table 7-1. Anticipated Area of Impact at each Crossing

Segment	Surface Water Crossing	Width (ft)	Length (ft)	Area of Impact (acre)	Comment
D-5b	Stream 1	6	125	0.02	
D-5b	Wash 6	1	125	0.00	
D-5b	Wash 7	10	271	0.06	drainage parallel to border
D-5b	Wash 13a,b,d	7	885	0.14	drainage parallel to border
D-5b	Wash 13c	3	135	0.01	drainage parallel to border
D-5b	Wash 13e	2	14	0.00	small drainage that connects to 13c
D-5b	Wash 16	4	125	0.01	
D-5b	Wash 17	10	125	0.03	
D-5b	Wash 20	10	125	0.03	
D-5b	Wash 22	6	125	0.02	
D-5b	Wash 23	20	452	0.21	drainage parallel to border
D-5b	Wash 25	6	125	0.02	
D-5b	Wash 26	4	125	0.01	
D-5b	Wash 31	4	125	0.01	
D-5b	Wash 32	4	125	0.01	centerline was corrected
D-5b	Stream 2	20	125	0.06	
D-5b	Wash 34	2	70	0.00	
D-5b	Wash 36a	3	140	0.01	
D-5b	Wash 36b	3	158	0.01	
D-5b	Wash 36c	6	125	0.02	
D-5b	Wash 37b	6	258	0.04	drainage parallel to border
D-5b	Wash 38	6	125	0.02	
D-5b	Santa Cruz River	150	60	0.21	
D-5b	subtotal			0.94	
D-6	Wash 44b	10	265	0.06	drainage parallel to border
D-6	subtotal			0.06	
D-5b/D-6	Grand Total			1.00	

In areas where primary pedestrian fencing must cross a wash, fences will be designed to ensure that the normal flow of water is not impeded. Regular maintenance of the fence will occur to remove any debris or snags that could block normal flows. Energy dissipation measures, as prescribed by the SWPPP, will be installed at each wash crossing to prevent long-term erosion and sedimentation.

To prevent any contamination from the accidental spill of petroleum, oils, and lubricants (POL) into surface waters, equipment and maintenance activities will not be staged within 100 feet of any surface water resources. In addition, a SPCCP will be implemented prior to the start of construction, and all personnel will be briefed on the implementation and responsibilities of this plan. The bid/build contractor will be required to prepare and implement the SPCCP.

7.2.2 Floodplains

Due to the general north/south orientation of floodplains within the project corridor and the need to place infrastructure parallel to the U.S./Mexico border, the Planned Action will result in the unavoidable direct impact on approximately 3 acres of jurisdictional floodplains, primarily due to road construction. To minimize impacts to the floodplain, however, CBP elected to install vehicle fence rather than primary pedestrian fence. The vehicle fence will be removed prior to each monsoon season to avoid impediments to floodwater conveyance and damage to the fence. Consequently, negligible impacts to the floodplain will occur. In accordance with the wishes of the DHS Secretary, CBP will continue to coordinate with USIBWC and Santa Cruz County regarding floodplain issues associated with the fence and road construction within the Santa Cruz River floodplain. Fences installed at other stream crossings will be bollard-style fences that will be designed to avoid increases of flood duration, elevations, velocities and frequencies.

SECTION 8.0
BIOLOGICAL RESOURCES

8.0 BIOLOGICAL RESOURCES

8.1 AFFECTED ENVIRONMENT

8.1.1 Vegetation

Past biological and reconnaissance surveys within and near the project corridor have identified three Chihuahuan desert communities that exist in and near the project corridor. The classification of these communities follows Brown (1994) and utilizes variation in general species composition and appearance. The following discussions are summaries of the communities described in the 2004 TVB EA (CBP 2004a).

Interior Southwestern, Cottonwood–Willow Series

Dominated by Fremont cottonwood (*Populus fremontii*) and narrow-leaf cottonwood (*P. angustifolia*), this series is typically found in open riparian canyons or on bajadas. Vegetation communities of the Cottonwood–Willow series are exposed to full sunlight and warm, dry air. The typical forest structure in this series is an open crowned forest with lower shrub and forb layers. Within the project corridor, this series is limited to a thin ribbon within the Santa Cruz floodplain and one of its major tributaries.

Madrean Evergreen Woodland

The Madrean Evergreen Woodland community occurs in a small isolated pocket west of the Santa Cruz River. In this community, Emory oak (*Quercus emoryi*) and Mexican blue oak (*Q. oblongifolia*) formed an open canopy, with trees to 40 feet high, and contained shrub layer of indigobushes (*Dalea* spp.), buckwheat (*Eriogonum* spp.), and bricklebush (*Brickellia* spp.). Alligator bark juniper (*Juniperus deppeana*) was the only coniferous species that occurred in this community. The sparse herbaceous layer beneath typically consisted of grasses and did not support leaf succulents or cacti. As with the majority of areas within the project corridor; heavy cattle grazing was evident in this community.

Scrub-Grassland (Semidesert), Mixed Grass Series

Found on a variety of soils at elevations, this community is the most important grassland series in Arizona and is quite diverse. Native bunch-grasses and fire-tolerant species of this series have suffered from cattle grazing and fire suppression, thus permitting the proliferation of invasive shrubs and cacti. The community is typically made up of shrubs and succulents scattered among mixed stands of perennial bunch-grasses and annual grasses of uniform height. It is the most widely distributed community within the project corridor, and is composed of grassy landscapes broken up by widely scattered scrub trees. This community comprises the vast majority of the project corridor and 100 percent of the temporary staging areas. Along washes within the scrub-grassland communities were narrow bands of Riparian Deciduous Forest that contained similar canopy and understory species of the Madrean Evergreen Woodlands.

8.1.2 Wildlife and Aquatic Resources

The native faunal components of southeastern Arizona include 370 species of birds, 109 mammal species (Lowe 1964, Hoffmeister 1986), 23 amphibian species (Lowe 1964, Lowe and Holm 1992), and 72 species of reptiles (Lowe 1964, U.S. Department of Interior [USDOI] 1989, USACE 1990). Fish diversity in the major river basins and springs of the study area is relatively low and many species are not native (Minckley 1973; Rinne and Minckley 1991; Robbins et al. 1991). The Santa Cruz River system is known to support 12 fish species.

Numerous wildlife and aquatic species have been documented within and near the project corridor and its ROI as a result of past biological surveys. In-depth discussions of the wildlife and aquatic resources that occur within the ROI and project corridor are provided in the 2004 TVB EA and the 2007 Fence EA (CBP 2004a and 2007); those discussions are incorporated herein by reference. In summary, some of the more common birds observed include: white-winged dove (*Zenaida asiatica*), Chihuahuan raven (*Corvus cryptoleucus*), Mexican jay (*Aphelocoma ultramarine*), northern harrier (*Circus cyaneus*), red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), turkey vulture (*Cathartes aura*), Gambel's quail (*Callipepla gambelii*), scaled quail (*Callipepla squamata*), ash-throated flycatcher (*Myiarchus cinerascens*), western kingbird (*Tyrannus verticalis*), black-throated sparrow (*Amphispiza bilineata*), and lark sparrow (*Chondestes grammacus*). Mammals observed include: desert cottontail (*Sylvilagus auduboni*), antelope jackrabbit (*Lepus alleni*), and mule deer (*Odocoileus hemionus*). The Sonoran spotted whiptail (*Aspidoscelis sonorae*) is the only reptile species observed during recent surveys.

The results of recent pedestrian surveys performed February and April 2008 are presented in Appendix D. Additional bird species observed during the surveys included morning dove (*Zenaida macroura*), great horned owl (*Bubo virginianus*), gila woodpecker (*Melanerpes uropygialis*), Northern flicker (*Colaptes auratus*), California quail (*Callipepla californica*), Montezuma quail (*Cyrtonyx montezumae*), killdeer (*Charadrius vociferus*), loggerhead shrike (*Lanius ludovicianus*), savannah sparrow (*Passerculus sandwichensis*), verdin (*Auriparus flaviceps*), cactus wren (*Campylorhynchus brunneicapillus*), Northern cardinal (*Cardinalis cardinalis*), and greater roadrunner (*Geococcyx californianus*). Black-tailed jackrabbit (*Lepus californicus*) and coyote (*Canis latrans*) were the only two mammals observed.

Among the habitats found in the vegetation types described in the previous subsection, those occurring in riparian areas (cottonwood–willow riparian woodlands) are the most important for supporting wildlife. These riparian-associated communities are particularly important to vertebrates, whose density and diversity within these communities are two to three times greater than in the surrounding habitats (CBP 2004a).

8.1.3 Protected Species and Critical Habitat

A total of 16 Federally protected species and three candidate species (Table 8-1) have the potential to occur within Santa Cruz County (USFWS 2007). Of these, 10 are

potentially found within or near the project corridor. A brief description of these 10 species and their habitat requirements are presented in the following paragraphs.

Table 8-1. Federally-listed and Proposed Species Potentially Occurring within Santa Cruz County, Arizona

Common/Scientific Name	Federal Status	Habitat	Potential to Occur within the Project Region
PLANTS			
Canelo Hills ladies'-tresses (<i>Spiranthes delitescens</i>)	E	Finely grained, highly organic, saturated soils of cienegas.	No – No saturated soils located in the project corridor.
Huachuca water umbel (<i>Lilaeopsis schaffneriana</i> spp. <i>recurva</i>)	E	Cienegas, perennial low gradient streams, wetlands	Yes – known populations in the Santa Cruz River; however, none were noted within the project corridor during recent surveys.
Pima pineapple cactus (<i>Coryphantha scheeri</i> var. <i>robustispina</i>)	E	Sonoran desertscrub or semi-desert grassland communities.	Yes – Nogales represents the southernmost portion of its range; however, none were observed within the project corridor footprint
INVERTEBRATES			
Stephan's riffle beetle (<i>Hetrelmis stephani</i>)	C	Free-flowing springs and seeps.	No – The project corridor is not located in known habitat.
Huachuca springsnail (<i>Pyrgulopsis thomsoni</i>)	C	Aquatic areas, small springs with vegetation and slow moderate flow.	No – No suitable habitat present.
BIRDS			
Yellow-billed cuckoo (<i>Coccyzus americanus</i>)	C	Large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries).	No – No suitable habitat is present.
California brown pelican (<i>Pelecanus occidentalis californicus</i>)	E	Feed in shallow estuarine waters; nest on small coastal islands.	No – No suitable habitat present.
Mexican spotted owl (<i>Strix occidentalis lucida</i>)	T	Nests in canyons and dense forests with multi-layered foliage structure.	Yes – Critical habitat designated east of project corridor; however, no coniferous forests exist within or adjacent to the project corridor.
Southwestern willow flycatcher (<i>Empidonax traillii extimus</i>)	E	Cottonwood/willow and tamarisk vegetation communities along rivers and streams.	Yes – Potential foraging and nesting habitat may be present within the Santa Cruz River system; however, within the project corridor there is no suitable habitat.

Table 8-1. continued

Common/Scientific Name	Federal Status	Habitat	Potential to Occur within the Project Region
AMPHIBIANS			
Chiricahua leopard frog (<i>Rana chiricahuensis</i>)	T	Streams, rivers, backwaters, ponds, and stock tanks.	Yes – Potentially suitable habitat may exist in perennial pools of the Santa Cruz River floodplain and its tributaries as well as nearby stock tanks.
Sonora tiger salamander (<i>Ambystoma tigrinum stebbinsi</i>)	E	Stock tanks and impounded cienegas in San Rafael Valley, Huachuca Mountains.	No – The project corridor is not located in known habitat.
MAMMALS			
Jaguar (<i>Panthera onca</i>)	E	Found in tropical rainforests, arid scrub, and wet grasslands and prefer dense forests or swamps with a ready supply of water	Yes – Sightings have been documented west of the project corridor within the CNF.
Lesser long-nosed bat (<i>Leptonycteris curasoae yerbabuena</i>)	E	Desertscrub habitat with agave and columnar cacti present as food plants.	Yes – Potential foraging habitat but no suitable roosting habitat present.
Ocelot (<i>Leopardus pardalis</i>)	E	Humid tropical and sub-tropical forests, savannahs, and semi-arid thornscrub.	Yes – Potentially suitable habitat exists in densely vegetated areas of the Santa Cruz River floodplain and its tributaries.
FISHES			
Desert pupfish (<i>Cyprinodon macularius</i>)	E	Shallow springs, small streams, and marshes.	No – Native Arizona populations located on Organ Pipe Cactus National Monument and additional refugia populations north of project corridor.
Gila chub (<i>Gila intermedia</i>)	E	Pools, springs, cienegas, and streams.	Yes – Potentially suitable habitat exists in the Santa Cruz River system.
Gila topminnow (<i>Poeciliopsis occidentalis occidentalis</i>)	E	Small streams, springs, cienegas and vegetated shallows.	Yes – Potentially suitable habitat exists in the Santa Cruz River system.
Sonora chub (<i>Gila ditaenia</i>)	T	Perennial and intermittent shallow to moderate streams with boulders and cliffs.	No – The project corridor is not located in known habitat.

Legend: E – Endangered T – Threatened C – Candidate
Source: USFWS 2007

Jaguar

The jaguar is the largest and most robust of the North American cats. The southwestern U.S. and Sonora, Mexico, are the extreme northern limits of the jaguar's range, which primarily extends from central Mexico, south through Central and South America to northern Argentina (Hatten et al. 2002). The jaguar is found near water in the warm tropical climate of savannahs and forests. Information on jaguar ecology and

behavior, especially at the northern edge of the species' range, is very limited. Habitat studies in the core part of their range indicate a close association with water, dense cover, and sufficient prey, and an avoidance of highly disturbed areas (Hatten et al. 2002). Jaguar distribution patterns over the last 50 years and recent observations of individuals suggest that southeast Arizona is the most likely area for future jaguar occurrence in the U.S. (Hatten et al. 2002).

Ocelot

The ocelot inhabits desertscrub communities in Arizona (AZGFD 2004). The critical component in suitable habitat for the ocelot is dense cover. The minimum acreage required for an area to be classified as suitable habitat is 99 acres of brush or 74 acres of two or more proximate brush stands (USFWS 1990). The historic range of the ocelot includes southern Texas and Arizona to northern Argentina (USFWS 1990). Virtually nothing is known of the ocelot in Arizona, but reports of ocelots in southeastern Arizona warrant further investigation of its status in Arizona and northern Sonora.

Lesser long-nosed bat

The lesser long-nosed bat was listed as endangered on September 30, 1988 (53 FR 38456). Lesser long-nosed bats are a nectar-, pollen-, and fruit-eating species that migrate into southern New Mexico and Arizona seasonally from Mexico. Scattered small agave plants have the potential to occur within the project corridor and could provide potential foraging habitat.

Pima pineapple cactus

The Pima pineapple cactus was designated as endangered on September 23, 1993 (58 CFR 49875). The Pima pineapple cactus is found at elevations between 2,300 and 4,500 feet in Pima and Santa Cruz Counties. Pima pineapple cacti are 4 to 18 inches tall, dome-shaped, with silky yellow flowers that bloom in early July with summer rains (58 CFR 49875). They are found in alluvial basins or on hillsides in semi-desert grassland and Sonoran desertscrub. The project corridor lies in the southernmost portion of the Pima pineapple cacti known range. The species occupies habitats that are flat and sparsely vegetated. Suitable habitat for the Pima pineapple cactus exists throughout the project area; however, recent surveys of the project corridor indicated that no Pima pineapple cactus specimens were observed within the project footprint.

Huachuca water umbel

The Huachuca water umbel, a member of the parsley family, is a herbaceous semi-aquatic perennial (AZGFD 2003). Flowering has been observed from March through October, with fruit forming in late fall. However, the Huachuca water umbel is thought to reproduce primarily through rhizomes. The rhizomes of the Huachuca water umbel branch freely, forming large mats, but require an intermediate level of flooding frequency. The plant does not compete well with larger, semi-aquatic species such as sedges and bulrushes, but populations can be destroyed when floods are too frequent. It appears that the Huachuca water umbel flowers are self fertile, and rapid colonization of ponds in San Bernardino National Wildlife Refuge (SBNWR) is evidence that this species may have an extended seed dormancy period (AZGFD 2003).

Huachuca water umbel inhabits southwestern New Mexico, southeastern Arizona, and Sonora, Mexico (AZGFD 2003). In Arizona, Huachuca water umbel has been found in three counties. In Cochise County, it has been found in the San Bernadino National Wildlife Refuge, Leslie Canyon National Wildlife Refuge, the Huachuca Mountains, the Babocomari River, the San Pedro River area, and at Saint David. In Santa Cruz County, it has been found near Sonoita Creek, Papago Springs, Canelo Hills/Turkey Creek, on the Audubon Research Ranch, and San Rafael Valley. However, no Huachuca water umbels were observed within the project corridor during recent surveys.

Mexican spotted owl

Mexican spotted owls (MSO) are mostly solitary outside of the breeding season (AZGFD 2005). They roost during the day and hunt at dusk or at night. MSOs nest, roost, and forage in a diverse array of biotic communities. The mixed-conifer forest type is the most common habitat used for these activities throughout most of its range (USFWS 1995). In southern Arizona, Madrean pine-oak forests are also commonly used for habitat (USFWS 1995). Nesting occurs in canyons and older forests of mixed-conifer or ponderosa pine/Gambel's oak (*Quercus gambelii*) with a multi-layered foliage structure, usually at elevations between 4,100 to 9,000 ft above mean sea level (amsl). Foraging and juvenile dispersal corridors are often open, oak-dominated habitats. Sites with cool microclimates appear to be of importance or are preferred for nesting (USFWS 1995).

The MSO's historic range is southern Utah and Colorado south through Arizona and New Mexico to the Mexican Plateau (states of Michoacan and Guanajuato). It currently occupies most of its historic range; however, it does not occur uniformly throughout its range (USFWS 1995). The MSO has not recently been reported along major riparian corridors in Arizona and New Mexico, nor in historically documented areas of southern Mexico (USFWS 1995). In Arizona, the MSO is patchily distributed in forested mountains statewide (AZGFD 2005). There are no coniferous forests within or adjacent to the project corridor that would support MSO.

Southwestern willow flycatcher

Southwestern willow flycatchers migrate to breeding territories by late April to early May and leave for wintering grounds in August and September (AZGFD 2002b). The southwestern willow flycatcher occurs in riparian habitats associated with dense growths of willows, mulefat (*Baccharis salicifolia*), arrowweed (*Pluchea sericea*), buttonbush (*Cephalanthus occidentalis*), tamarisk (*Tamarix* sp.), Russian olive (*Eleagnus angustifolia*), often with a scattered overstory of cottonwood (AZGFD 2002b). These habitats tend to be rare, widely separated, small, and usually separated by vast expanses of arid lands. Preferred habitats tend to be classified as forested wetlands or scrub-shrub wetlands.

The breeding range of this species includes southern California, southern Utah, southern Nevada, southwestern Colorado, Arizona, New Mexico, and western Texas. It is a neotropical migrant and most likely winters in Mexico and Central America. In

Arizona, the southwestern willow flycatcher breeds in large numbers along the lower San Pedro River and the Gila River (U.S. Geological Survey [USGS] 2003). Although the Santa Cruz River system does support southwestern willow flycatcher populations, the riparian corridor within and adjacent to the project corridor does not contain the structural or species diversity or width to provide suitable habitat for breeding or nesting birds.

Gila chub

Gila chubs are normally found in the smaller headwater streams, cienegas, and springs or marshes of the Gila River basin in Arizona and New Mexico and in the Santa Cruz and San Pedro rivers in Arizona and Mexico (AZGFD 2002a). Adults prefer habitats that consist of deep pools with heavily vegetated margins and undercut banks. Juveniles prefer habitats with riffles, pools, or undercut banks of runs. The associated plant community is a broadleaf riparian habitat consisting of cottonwood (*Populus* sp.), willow (*Salix* sp.), ash (*Fraxinus* sp.), alder (*Alnus* sp.), sycamore (*Platanus* sp.), walnut (*Juglans* sp.), and desert broom (*Baccharis* sp.) in association with submerged aquatic vegetation typical of cienega and marsh habitats. Gila chubs are usually found in association with Gila topminnow, desert and Sonora sucker, and longfin and speckled dace (AZGFD 2002a).

Historically, Gila chubs were found in headwater streams of the Gila River drainage in Arizona and New Mexico, and likely in the San Pedro and Santa Cruz River systems in Sonora, Mexico (AZGFD 2002a). In Arizona, Gila chubs are found in the following drainages: Cienega Creek, Sabino Canyon, and Sheehy Spring of the Santa Cruz River; Eagle, Bonita, Harden, and Cienega creeks, San Carlos River, and Blue River of the Middle Gila River; Bass, O'Donnell, and Redfield canyons; Babocomari River and Turkey Creek of the San Pedro River; Silver and Sycamore creeks of the Agua Fria River; and Spring and Walker creeks of the Verde River. In Arizona, this species has been extirpated from Monkey Spring of the Santa Cruz River basin and Fish and Cave creeks of the Salt River basin. There is no suitable habitat for Gila chub within the project corridor.

Gila Topminnow

The Gila topminnow is one of two subspecies of the Sonoran topminnow (*Poeciliopsis occidentalis*) (AZGFD 2001a). This species prefers lower-elevation (below 5,000 ft amsl) shallow, warm, fairly quiet waters with dense aquatic vegetation and algal mats, usually along stream margins or below riffles, with sandy substrates sometimes covered with organic mud and debris (Weedman 1998). Topminnows usually occupy pools, glides, and backwaters more frequently than marshes or areas of fast flow. They can withstand water temperatures from near freezing up to 90 to 100 degrees Fahrenheit (° F). They also can live in a fairly wide range of water chemistries, with pH ranging from 6.6 to 8.9, dissolved oxygen levels from 2.2 to 11 parts per million, and salinity ranging from fresh water (near zero parts per thousand) to sea water (32 parts per thousand) (Weedman 1998).

Historically, the Gila topminnow was widespread in the Gila River drainage below 5,000 ft amsl in New Mexico, and Arizona (AZGFD 2001a). In Arizona, they were once found in most perennial springs, streams and vegetated margins of rivers in the Gila River drainage in Yavapai, Gila, Pinal, Maricopa, Graham, Greenlee, Cochise, Pima, Santa Cruz, and Yuma counties (AZGFD 2001a). The Gila topminnow is known to have occurred in the San Francisco River at Frisco Springs, New Mexico and in Arizona along the main stem of the Gila River, Salt River, Tonto Creek, San Pedro River, Santa Cruz River, Sonoita Creek, Cienega Creek, and Sabino Canyon. They likely were once abundant in the Lower Colorado River, Verde River, and San Simon River in Arizona. They are also known to occur throughout the Rios de la Concepcion and Sonora in northern Sonora, Mexico (Weedman 1998). Although Gila topminnow could be found within the Santa Cruz River basin, the topminnow is not expected to occur within the project corridor. No recent records of its presence has been documented in this region and recent observations at the Santa Cruz River within the project corridor indicated an absence of this species.

Chiricahua leopard frog

The Chiricahua leopard frog is one of seven known leopard frogs found in Arizona (AZGFD 2001b). This species lives in a variety of water sources including rocky streams with deep rock-bound ponds, river overflow pools, oxbows, permanent springs, stock tanks, and ponds (AZGFD 2001b). The riparian habitat along these water bodies generally consist of oak and mixed oak and pine woodlands, but it can also range into areas of chaparral, grassland, and even desert.

The Chiricahua leopard frog's range includes mountain regions of central and southeastern Arizona; southwestern New Mexico, from the Sierra Madre Occidental south to Chihuahua and Durango, Mexico (AZGFD 2001b). Its Arizona range is divided into two portions: from montane central Arizona east and south along Mogollon Rim to montane, parts of western New Mexico; and the southeastern montane sector of Arizona and portions of Sonora, Mexico (Platz and Mecham 1979). Stock tanks and other intermittent pools could occur in the project region, although no suitable habitat to support the Chiricahua leopard frog occurs within the project corridor.

State

The Arizona Natural Heritage Program (ANHP) maintains a list of species with special status in Arizona. The ANHP list includes flora and fauna whose occurrence in Arizona is or may be in jeopardy, or has known or perceived threats or population declines (AZGFD 2006). The ANHP list is provided in Appendix E. These species are not necessarily the same as those protected under the ESA of 1973, as amended.

The project corridor could be considered suitable habitat for various state sensitive bird, mammal, and plant species; however, no state sensitive species were observed during the February and April 2008 pedestrian surveys.

8.2 ENVIRONMENTAL CONSEQUENCES

The Planned Action will result in the permanent loss of 116 acres of vegetation, which includes 106 acres of Scrub-Grassland, 8 acres of Madrean Evergreen Woodlands, and less than 2 acres of Cottonwood-Willow. Scrub-Grassland is dominated by herbaceous species and, therefore, would be the most resistant to disturbance. While not as abundant, due to its affinity for washes, the Cottonwood-Willow Woodland is common both locally and regionally; thus, degradation or loss of a small portion of this community will be a moderate impact within a local or regional context. Cottonwood-Willow is rather unique to major washes and southwestern river systems. This community is important habitat to many riparian wildlife and aquatic species; therefore, the loss of any such community, regardless of size, is undesirable. However, the loss of 2 acres of such habitat will be offset by the indirect benefits to this community from preventing the impacts continued of illegal traffic.

Storage of equipment and materials at the temporary staging areas will result in the temporary disturbance of 26 acres of the common Scrub-Grassland community. Upon completion of construction activities, natural vegetation will be allowed to regenerate from the existing seed bank, undamaged root stocks of shrubs, and stem segments of cacti, or undergo active rehabilitation if deemed necessary. Therefore, there will be only negligible impacts within staging areas.

Operation of temporary lighting will result in negligible indirect impact on vegetation adjacent to the project corridor. The impact on vegetation communities from temporary lighting will not inhibit ecological processes, population size, or individual fecundity of any plant species adjacent to the project corridor.

8.2.1 Wildlife

The Planned Action will have a direct impact on wildlife, with a loss of 116 acres of habitat from construction of the primary pedestrian fence and maintenance road. This impact will be negligible due to existing disturbances and the vast areas of similar habitat north of the project corridor. Additionally, some displacement of wildlife will occur due to construction-related disturbances (e.g., noises and temporary nighttime lighting). However, these effects will be considered minor due to the similar habitat adjacent to the project corridor and because of the short duration of construction activities.

There will be a moderate impact associated with restriction of transboundary movement of wildlife. While a primary pedestrian fence will serve as a physical barrier to many wildlife species, particularly large mammals such as mule deer that migrate north and south of the U.S./Mexico border, corridors for wildlife movement will still exist. By design, the bollard-style fence will contain openings that are large enough to allow transboundary migration of small mammals, reptiles, and amphibians. Thus, the primary pedestrian fence will not affect the genetic variability of such species, especially since they are regionally common.

There will be a temporary impact on wildlife species from increased noise during construction. Physiological responses from noise range from minor responses, such as an increase in heart rate, to more damaging effects on metabolism and hormone balance. Long-term exposure to noise can cause excessive stimulation to the nervous system and chronic stress that is harmful to the health of wildlife species and their reproductive fitness (Fletcher 1990). Behavioral responses vary among species of animals and even among individuals of a particular species. Variations in response may be due to temperament, sex, age, or prior experience. Minor responses include head-raising and body-shifting, and more disturbed mammals will usually travel short distances. Panic and escape behavior results from more severe disturbances, causing the animal to leave the area (Busnel and Fletcher 1978). Since the most active period of movement for most wildlife species is during nighttime or low daylight hours, and construction activities are expected to be conducted during daylight hours to the maximum extent practicable, temporary impacts of noise on wildlife species are expected to be negligible.

Construction and operation of TI will increase border security in the project corridors and may result in a change to illegal traffic patterns. However, changes to illegal alien traffic patterns result from a myriad of factors in addition to USBP operations and therefore are considered unpredictable and beyond the scope of this ESP. Beneficial impacts on wildlife populations and habitats located north of the project corridor are also anticipated from the reduction of illegal pedestrian traffic and consequent USBP enforcement actions.

Since construction is expected to begin sometime at summer of 2008, avoidance of migratory bird nesting season (March through September) is not likely possible. Therefore, preconstruction surveys to identify nesting activity will be conducted, and USFWS and AZGFD will be notified of the results. Any active nests occupied by migratory bird species will be avoided to the extent practicable.

8.2.2 Protected Species

Although the Secretary's waiver means that CBP no longer has any specific legal obligations under the ESA, for the TI segments addressed in this ESP, the Secretary committed the Department to responsible environmental stewardship of our valuable natural and cultural resources. CBP supports this objective and has applied the appropriate standards and guidelines associated with the ESA as the basis for evaluating potential environmental impacts and appropriate mitigations.

Suitable habitat conditions for the jaguar, lesser long-nosed bat, Gila topminnow, Pima pineapple cactus, and Huachuca water umbel occur within the project region. However, none of these species were observed during the February and April 2008 surveys or previous surveys conducted as part of other EAs. The Planned Action may affect, but is not likely to adversely impact the jaguar and lesser long-nosed bat. Disturbances of habitat and travel corridors and loss of forage species would be minimal compared to the surrounding available habitat.

While avoidance will be the primary conservation measure, it can not always be achieved; thus, CBP has prepared a list of appropriate BMPs (see Appendix B) for the protected species. This list of BMPs was developed in close coordination with USFWS and is specific to CBP's planned TI construction and operation activities. The decision to install Normandy Style vehicle fence within the Santa Cruz River floodplains, rather than primary pedestrian fence, avoids potential impacts to Huachuca water umbel and Gila topminnow, even though neither species was observed within the project corridor. BMPs for these and other species are summarized below:

- CBP will develop (in coordination with USFWS) a training plan regarding Trust Resources for construction and maintenance personnel. The program will include the following topics: occurrence of the listed and sensitive species in the area, their general ecology, sensitivity of the species to human activities, legal protection afforded these species, reporting requirements, and project features designed to reduce the impacts to these species and promote continued successful occupation of the project area environs.
- Individual animals found in the project area should be relocated by a qualified specialist (an individual or agency personnel with permits to handle the species) to a nearby safe location in accordance with accepted species handling protocols. This is particular to Chiricahua leopard frogs.
- All construction and maintenance projects in habitats that support Federally protected species should have a designated biological monitor on site during the work. The biological monitor should be in charge of implementing and documenting construction-related BMPs as designed for the project to reduce the potential for adverse effects to the species or their habitats. Reports from the biological monitor should be used for development of the post-construction report.
- Consideration will be given to proper design and locating roads such that the potential for entrapment of surface flows within the roadbed due to grading should be avoided or minimized. Depth of any pits created will be minimized so animals do not become trapped.
- Materials such as gravel or topsoil will be obtained from existing developed or previously used sources, not from undisturbed areas adjacent to the project area.
- Areas already disturbed by past activities or those that will be used later in the construction period will be used for staging, parking, and equipment storage, to the maximum extent practicable.
- Surface water from untreated sources, including water used for irrigation purposes, will not be used for construction or maintenance projects located within 1 mile of aquatic habitat for protected aquatic species. Groundwater or surface water from a treated municipal source will be used when close to such habitats.
- Construction will avoid areas containing columnar cacti (saguaro, organ pipe) or agaves that provide the forage base for the lesser long-nosed bat, to the maximum extent practicable.

- Salvage of individual Pima pineapple cacti, if any undiscovered specimens are found, will be considered only when on-site or off-site habitat conservation is not possible and death of the cacti is unavoidable.
- Maintenance activities in Pima pineapple cactus habitat should not increase the existing disturbed areas, subsequent to the construction of the project.
- Use of existing roads and trails should be maximized in areas of suitable habitat for the Pima pineapple cactus. Maps of suitable habitat areas should be available and protection of the Pima pineapple cactus stressed in environmental education for CBP personnel and contractors involved in construction or maintenance of facilities.
- To prevent entrapment of wildlife species during emplacement of vertical posts/bollards, all vertical fence posts/bollards that are hollow (i.e., those that will be filled with a reinforcing material such as concrete), shall be covered so as to prevent wildlife from entrapment. Covers will be deployed from the time the posts or hollow bollards are erected to the time they are filled with reinforcing material.

SECTION 9.0
CULTURAL RESOURCES

9.0 CULTURAL RESOURCES

9.1 AFFECTED ENVIRONMENT

9.1.1 Cultural Resources Overview

A cultural resources overview of the project region is incorporated herein by reference from the 2003 EA (CBP 2003). In summary, the cultural setting of the project area is generally divided into six different periods: Pre-Clovis, Paleoindian, Archaic, Formative, Late Prehistory and Protohistory, and Spanish Exploration and Settlement. These periods are commonly subdivided into smaller temporal phases based on particular characteristics of the artifact assemblages encountered in each of three archaeological regions within southern Arizona.

9.1.2 Previous Investigations

Past cultural investigations for the project corridor are described in the 2003 EA and the descriptions are incorporated herein by reference (CBP 2003). In summary, a literature review was conducted at the Arizona State Museum, Arizona SHPO office, and CNF. A total of 38 recorded cultural resources surveys were previously conducted within 1 mile of the project corridor.

9.1.3 Current Investigations

Pedestrian surveys were conducted along the project corridor in February, June and July 2008 (Moore and Carpenter 2008). Five newly recorded sites, twenty-five isolated artifact occurrences and five previously identified sites were relocated within the current investigations. Two of the previously recorded sites AR 03-05-03-368 and AR 03-05-03-369 were combined and assigned one ASM number (AZ EE:9:257{ASM}) bringing the total number of cultural resources sites documented in the current investigation to nine. Of the nine cultural resources documented in the current investigations six are recommended eligible for NRHP listing. Five of these eligible sites are International Border Monuments. One of the eligible cultural resource sites is a prehistoric lithic scatter that straddles the project APE.

Three of the sites relocated in the current investigation were found to be heavily deflated and do not meet the Arizona State Museum standards for sites. These sites were recommended ineligible for NRHP.

9.2 ENVIRONMENTAL CONSEQUENCES

Although the Secretary's waiver means that CBP no longer has any specific legal obligations under the NHPA, for the TI segments addressed in this ESP, the Secretary committed the Department to responsible environmental stewardship of our valuable natural and cultural resources. CBP supports this objective and has applied the appropriate standards and guidelines associated with the NHPA as the basis for evaluating potential environmental impacts and appropriate mitigations.

Based on the records search and current surveys, five Border Monuments (117, 117A, 118, 118A and 119) are the only known historic properties within the project corridor and are eligible for listing on the NRHP. The monuments will be avoided by construction activities. A temporary barrier will be placed around the monuments during construction activities as a mitigation measure, and all construction and earthwork in the proximity will be monitored by a qualified archaeologist.

Site AZ EE:9:257 is recommended eligible for NRHP listing and falls in the direct path of the APE. This site is recommended to be avoided and if avoidance is not possible a testing program should be implemented to mitigate adverse effects.

Construction and operation of TI will increase border security in the project corridors and may result in a change to illegal traffic patterns. However, changes to illegal alien traffic patterns result from a myriad of factors in addition to USBP operations and therefore are considered unpredictable and beyond the scope of this ESP.

SECTION 10.0
SOCIOECONOMICS



10.0 SOCIOECONIMICS

10.1 AFFECTED ENVIRONMENT

The socioeconomic environment of the project region is described in detail in the 2003 CBP Nogales Infrastructure Improvements EA, the 2004 TVB EA, the 2007 Road EA, and the 2007 Fence EA; the descriptions are incorporated herein by reference (CBP 2003, CBP 2004a, CBP 2007a-c). In summary, the previous EAs examined population structure, housing, and environmental justice and protection of children.

The ROI for the Planned Action is Santa Cruz County. The estimated 2005 population of Santa Cruz County was 44,055. The City of Nogales accounts for almost half (21,830) of the total residents of Santa Cruz County (Arizona Department of Commerce 2007). The racial mix of Santa Cruz County consists predominantly of Caucasians (76 percent) and people claiming to be of some race other than Caucasian, African-American, Native American, Asian, Native Hawaiian, and other Pacific Islander (21 percent). About 81 percent of the total Caucasian population of Santa Cruz County claim to be of Hispanic origin (Arizona Department of Commerce 2007).

The total number of jobs in the study area in 2005 was 15,956, an increase of 18 percent over the number of jobs in 1990 (13,491) (U.S. Bureau of Economic Analysis 2003). The service industry provided the most jobs, followed by the retail trade industry and the government sector. The 2000 annual average unemployment rate for Santa Cruz County was 13.9 percent.

10.2 ENVIRONMENTAL CONSEQUENCES

Although the Secretary's waiver means that CBP no longer has any specific legal obligations under EO 12898 or EO 13045 for the TI segments addressed in this ESP, the Secretary committed the Department to responsible environmental stewardship of our valuable natural and cultural resources. CBP supports this objective and has applied the appropriate standards and guidelines associated with these EOs, as the basis for evaluating potential environmental impacts and appropriate mitigations.

While some residential areas and businesses (e.g., a golf course community) are located north of the project corridor along construction access routes, no housing units or businesses are located within the project corridor or adjacent to it, so no displacement of people, houses, or businesses will occur under the Planned Action. Land acquired through fee title will result in a loss of property taxes, as 111 acres of land will be transferred to the government, resulting in a minor, yet long-term adverse economic impact on the Santa Cruz County tax base.

During construction of the fence and road, there will be temporary, minor increases in population from the addition of construction crews in the area. Construction crews will likely stay at nearby hotels in Nogales. As a result, no additional demand for housing

will be anticipated during construction. The construction of the fences and roads will not require any additional demands on public services during or after construction.

The Planned Action will have a direct beneficial impact on the income of the local area resulting from the rental of construction equipment and purchase of materials, such as fuel and cement, during the construction period. While the exact amount of raw material expenditures is not known, these expenditures are expected to have a moderate, short-term beneficial impact on income.

Construction and operation of TI will increase border security in the project corridors and may result in a change to illegal traffic patterns. However, changes to illegal alien traffic patterns result from a myriad of factors in addition to USBP operations and therefore are considered unpredictable and beyond the scope of this ESP.

SECTION 11.0
UTILITIES AND INFRASTRUCTURE



11.0 UTILITIES AND INFRASTRUCTURE

11.1 AFFECTED ENVIRONMENT

The project is located within a remote and undeveloped area east of Nogales, Arizona, where no public roadways exist near the project corridor. The nearest roadways are rural all-weather aggregate roads connecting to Arizona State Highway (State Hwy) 80 (Patagonia Hwy). As identified in Figure 2-1, these roadways include David Drive, Royal Road, Kino Springs Drive, and El Camino Real. Access to the project corridor is provided via connections between these public roadways, USFS Road 4903 and the three privately-owned access roads. There are two sparsely developed residential areas located between the project corridor and State Hwy 80. David Road and North Royal Road provide access to State Hwy 80 through a rural residential area approximately 1 mile north of the project corridor on the western portion of the corridor, while the El Camino Real and Kino Drive provide access through a small developed golf course community located almost 3 miles north of the project corridor.

11.2 ENVIRONMENTAL CONSEQUENCES

The Planned Action will have only minor and temporary impacts on public roadways and traffic, as construction activities are expected to last less than 6 months. During construction, traffic from over-sized vehicles and material transport through residential areas will likely impose some minimal delays. The contractor will be required to coordinate and comply with transportation requirements and safety measures identified by the Santa Cruz County Public Works Department-Transportation Division to provide safe and efficient movement of equipment and materials to the project corridor. The potential for delays and disruption of traffic will not occur on a daily basis, as the heavy equipment transport will occur intermittently, and the equipment will be stockpiled at one of the temporary staging areas. Therefore, local and regional impacts on public roadways and traffic will be minimal and will return to near-normal conditions following the construction period.

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SECTION 12.0
HAZARDOUS MATERIALS



12.0 HAZARDOUS MATERIALS

12.1 AFFECTED ENVIRONMENT

Hazardous materials were discussed in the 2004 TVB EA and the discussion is incorporated herein by reference (CBP 2004a). Unregulated solid waste due to the increase of IA vehicle and foot traffic along the U.S./Mexico border has become a severe problem in recent years. BLM estimates that approximately 4 million pounds of trash was deposited by IAs in southern Arizona in 2004 and 2005 (Davis 2006). Clothing, water bottles, food, and other debris have been the most common waste materials observed during past surveys of the project corridor.

A Phase I environmental site assessment or visual inspection will be completed within the project corridor to make a determination of the location of any *recognized environmental conditions*. However, preliminary searches of data and maps on the USEPA's *Envirofacts Data Warehouse* web site revealed no known hazardous waste sites located within the project corridor. In addition, during cultural and biological surveys that were conducted along the project corridor, no visible evidence of potential environmental liabilities was observed.

12.2 ENVIRONMENTAL CONSEQUENCES

Although the Secretary's waiver means that CBP no longer has any specific legal obligations under the Comprehensive Environmental Response, Compensation and Liability Act, for the TI segments addressed in this ESP, the Secretary committed the Department to responsible environmental stewardship of our valuable natural and cultural resources. CBP supports this objective and has applied the appropriate standards and guidelines associated with the CERCLA as the basis for evaluating potential environmental impacts and appropriate mitigations.

Although no hazardous waste is anticipated to be stored within the project corridor, POL will be stored at the temporary staging areas in order to maintain and refuel construction equipment. However, these activities will include primary and secondary containment measures. Clean-up materials (e.g., oil mops) will also be maintained at the site to allow an immediate response in case an accidental spill occurs. Drip pans will be provided for the power generators and other stationary equipment to capture any POL that is accidentally spilled during maintenance activities or from equipment leaks.

Sanitation facilities will be provided during construction activities, and waste will be collected and disposed of by licensed contractors. No gray water will be discharged to the ground. Disposal contractors will use only established roads to transport equipment and supplies, and all waste will be disposed of in strict compliance with Federal, state, and local regulations, in accordance with the contractor's permits.

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