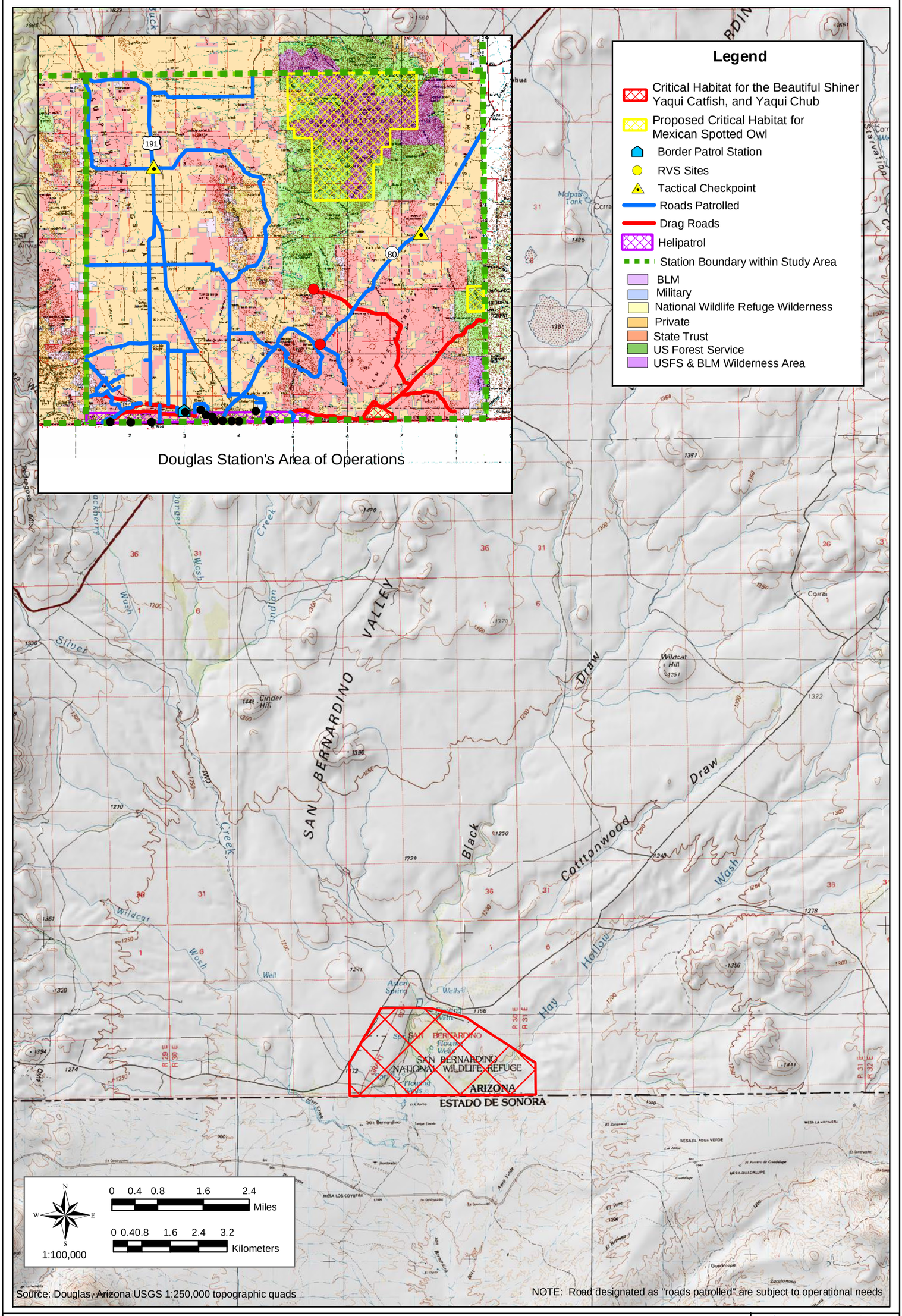

Source: Douglas, Arizona USGS 1:250,000 topographic quads

NOTE: Road designated as "roads patrolled" are subject to operational needs

Figure 3-10: Critical Habitat for the Beautiful Shiner, Yaqui Catfish, and Yaqui Chub (Douglas Station)

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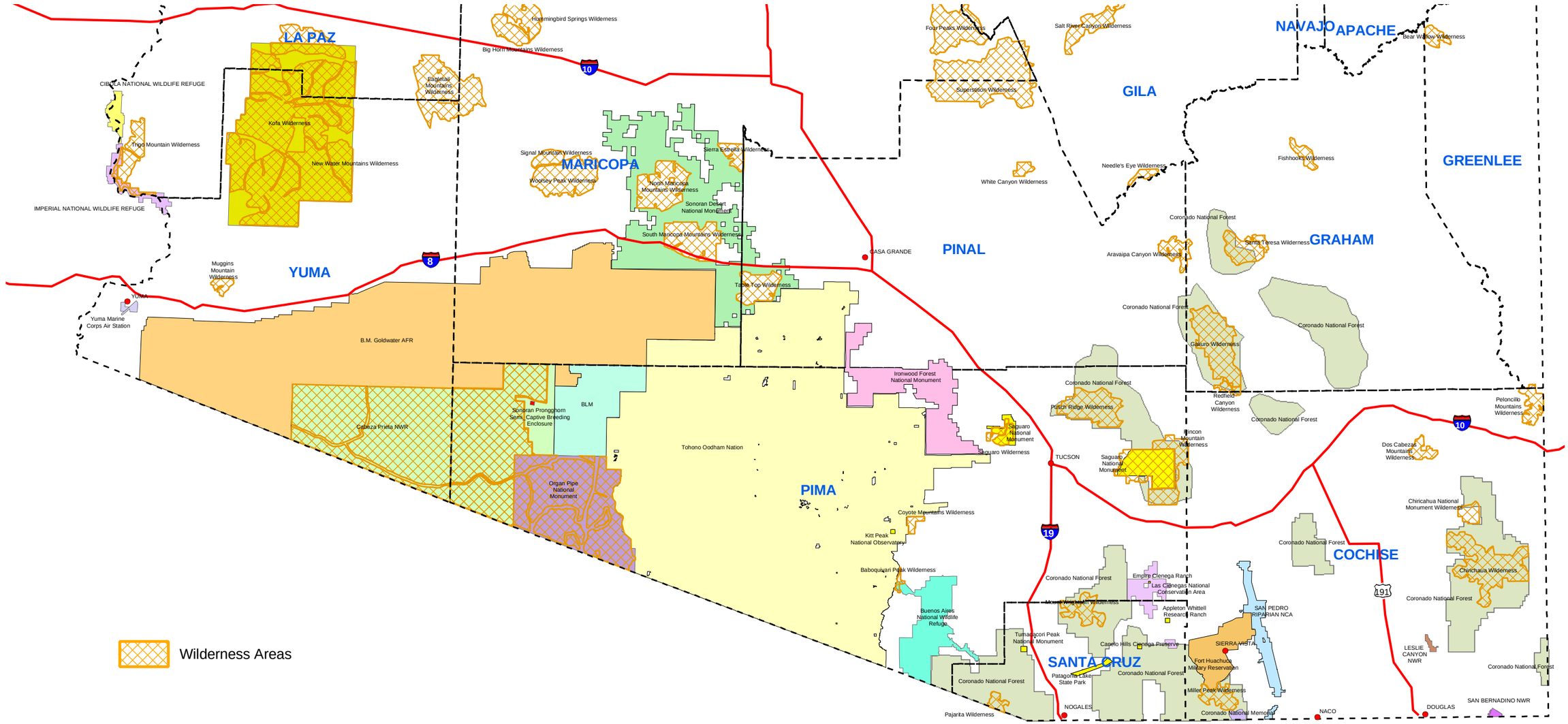

Figure 3-11: Environmentally Sensitive Areas within the Study Area

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Table 3-5. Unique and Environmentally Sensitive Areas in the Project Region

Area	Acreage	Management
Cochise County, Arizona		
Chiricahua National Monument	12,000	NPS
Coronado National Forest Chiricahua Wilderness Area Miller Peak Wilderness Area	2,475,000 87,700 20,228	USFS
Coronado National Memorial	4,750	NPS
Kartchner Caverns State Park	560	ASP
Ramsey Canyon Preserve	300	TNC
San Bernadino/Leslie Canyon Wildlife Refuges	3,549	USFWS
San Pedro Riparian National Conservation Area	56,500	BLM
Santa Cruz County, Arizona		
Appleton-Whittell Research Ranch	8,000	NAS
Canelo Hills Cienega	254	TNC
Coronado National Forest Parajita Wilderness Area Mt. Wrightson Wilderness Area Goodding Research Natural Area Madera Canyon Recreation Area Pena Blanca Recreation Area	2,475,000 7,553 25,260 545 49	USFS
Empire-Cienega Ranch	45,000	BLM
Patagonia Lake State Park	640	ASP
Patagonia/Sonoita Creek Preserve	850	TNC
Tubac Presidio State Historic Park	11	ASP
Tumacacori National Historic Park	16	NPS
Wild Chile Botanical Area	2500	USFS
Pima County, Arizona		
Baboquivari Peak Wilderness Area	2,040	BLM
Buenos Aires National Wildlife Refuge	115,000	USFWS
Cabeza Prieta National Wildlife Refuge	860,000	USFWS
Coyote Mountains Wilderness	5,080	BLM
Kitt Peak National Observatory		NOAOR
Organ Pipe Cactus National Monument	330,689	NPS
Saguaro National Monument	91,116	NPS
Yuma County, Arizona		
Cabeza Prieta National Wildlife Refuge	860,000	USFWS
Cibola National Wildlife Refuge	16,627	USFWS
Eagle tail Mountains Wilderness Area	97,800	BLM
Imperial National Wildlife Refuge	25,125	USFWS
Kofa National Wildlife Refuge	665,400	USFWS
Muggins Mountains Wilderness Area	7,711	BLM

Source: USGS 2002

Legend:
ASP = Arizona State Parks
BLM = Bureau of Land Management
NAS = National Audubon Society
NOAO = National Optical Astronomy Observatories
NPS = National Park Service
TNC = The Nature Conservancy
USFS = US Forest Service
USFWS = US Fish and Wildlife Service

3.6.1 Cochise County

3.6.1.1 Chiricahua National Monument

The Chiricahua National Monument encompasses 12,000 acres in the Chiricahua Mountains of southeastern Arizona, approximately 30 miles southeast of Willcox (NPS 2000a). These volcanic mountains rise above the surrounding grasslands to elevations ranging between 5,100 and 7,800 feet amsl. The Monument is located 120 miles east of Tucson on SR 186. The Chiricahua National Monument features 17 miles of maintained trail in a monument that is 90 percent wilderness. It is home to a wide variety of plant and animal species. Most conspicuous are the rare birds such as sulphur-bellied flycatchers (*Myiodynastes luteiventris*), Mexican chickadees (*Poecile sclateri*), and elegant trogans (*Trogon elegans*), which make the area a popular site for bird watching. Mammals such as the Apache fox squirrel (*Sciurus nayaritensis chiricahuae*), coatimundis (*Nasua nasua*), and peccaries (*Pecari tajacu*), as well as trees, including the Chihuahua pine and Apache pine (*Pinus englemanii*), are found within the Monument. The plants found in the area range from cacti in the lowlands; oaks, alligator bark juniper, and Arizona cypress (*Cypressus arizonica*) in the canyon forests; manzanita-buckthorn-skunkbush chaparral on ridges; and ponderosa pine, Douglas fir, and aspen on the highest slopes.

3.6.1.2 Coronado National Forest

The Coronado National Forest covers 2,475,000 acres of southeastern Arizona and southwestern New Mexico (USFS 2000a). Elevations range from 3,000 feet to 10,720 feet msl in 12 widely scattered mountain ranges or "sky islands" that rise from the desert floor, supporting diverse plant communities. Over 1,100 miles of trails, four small lakes, and eight Wilderness Areas encompassing 338,536 acres are found within the Coronado National Forest. The Wilderness Areas found within the study region of Cochise County are the Miller Peak Wilderness and Chiricahua Wilderness Areas.

- Chiricahua Wilderness Area: The Chiricahua Wilderness Area is located approximately 40 miles northeast of Douglas in the Chiricahua Mountains. It was established in 1964 and encompasses 87,700 acres (NWPS 2000b). There is wide variation in elevation, slope, moisture, flora, and fauna. Many birds found in the Wilderness Area and in nearby areas such as Cave Creek Canyon are species that are otherwise seen only in Mexico.

- Miller Peak Wilderness Area**:** The Miller Peak Wilderness Area is located six miles northwest of Sierra Vista in the southern portion of the Huachuca Mountains. It was established in 1984 and consists of 20,190 acres. Elevations range from 5,200 feet msl to 9,466 feet msl at Miller Peak itself. The Huachucas are famous as a haven for bird life and more than 170 species, including 14 species of hummingbirds, have been

observed. More than 60 species of reptiles and 78 species of mammals also are found in this range (NWPS 2000c).

3.6.1.3 Coronado National Memorial

The Coronado National Memorial is located in the south central border of Arizona, 25 miles west of Bisbee in the southern Huachuca Mountains. It commemorates the first major exploration of the American Southwest by Francisco Vasquez de Coronado, who was in search of the fabled Seven Cities of Cibola. The Memorial encompasses 4,750 acres of mostly oak woodland, a natural mountain habitat at an elevation about 5,000 feet amsl where a variety of plants and animals are found. The Memorial is known for its wide variety of birds; more than 140 species have been recorded here, including 50 resident birds (NPS 2000b).

3.6.1.4 Kartchner Caverns State Park

Kartchner Caverns State Park is the newest addition to the Arizona State Parks system. It is located nine miles southeast of I-10, in Benson, and encompasses 560 acres. The caves were initially discovered in 1974, but the State Park did not open until November 12, 1999. The massive limestone cave has 13,000 feet of passages, and two rooms as long as football fields. It is considered a "living cave" because the intricate formations continue to grow as dripping water slowly deposits minerals. Kartchner Caverns State Park is a natural refuge and roosting area for approximately 1,000 to 2,000 bats that roost in the caverns from late April to mid-September (ASP 2000a).

3.6.1.5 Ramsey Canyon Preserve

Ramsey Canyon Preserve is located 10 miles south of Sierra Vista and is managed by The Nature Conservancy (TNC). It is located in the Huachuca Mountains, bounded on three sides by the Coronado National Forest and encompasses 300 acres. A permanent stream (Ramsey Creek) and high canyon walls provide Ramsey Canyon with a moist, cool, and stable environment unusual in the desert southwest. Water-loving plants such as sycamores (*Platanus* sp.), maples (*Acer* sp.), and columbines (*Aquilegia* sp.) line the banks of Ramsey Creek, often growing within a few feet of cacti, yucca, and agaves. Communities ranging from semi-desert grassland to pine-fir forest are found within the canyon. Ramsey Canyon is noted for the 14 species of hummingbirds that have been seen at the canyon between April and October. In addition, Coue's deer (*Odocoielus virginianus*), coatis, mountain lion (*Puma concolor*), and dozens of varieties of butterflies are also found within the preserve. The Ramsey Canyon leopard frog (*Rana subaquavocalis*) exists only in Ramsey Canyon and several nearby

sites in the Huachuca Mountains and foothills. There are 45 mammal species and 20 species of reptiles and amphibians in and around the preserve (TNC 2000c).

3.6.1.6 San Bernadino/Leslie Canyon National Wildlife Refuge

This refuge complex includes the 2,309-acre San Bernadino National Wildlife Refuge (SBNWR), located on the US-Mexico border 17 miles east of Douglas and the 1,240-acre LCNWR, located 15 miles north of Douglas (USFWS 2000e). Topography of the SBNWR is situated at the bottom of a wide valley at 3,720 to 3,920 feet amsl elevation and encompasses a portion of the Yaqui River. LCNWR is located in rough mountainous terrain, encompassing Leslie Creek, providing valuable riparian habitat. Over 270 species of birds, various mammals, and numerous reptiles and amphibians can be seen at this refuge complex. It also has historically supported approximately one-quarter of the fish species native to Arizona. These include several federally protected species such as the Yaqui chub, Yaqui topminnow, beautiful shiner, and Yaqui catfish.

3.6.1.7 San Pedro Riparian National Conservation Area

The SPRNCA contains approximately 40 miles of the upper San Pedro River and is located between Sierra Vista and Bisbee. It is managed by the BLM's Tucson Field Office and contains over 58,000 acres of public land. The primary purpose for the designation is to protect and enhance the desert riparian ecosystem, a rare remnant of what was once an extensive network of similar riparian systems throughout the southwest. Wildlife is abundant in the SPRNCA because of the abundant food, water and cover within and surrounding the riparian zone. The SPRNCA supports over 350 species of birds, over 80 species of mammals, two native species and several introduced species of fish, and more than 40 species of amphibians and reptiles (BLM 2000e).

3.6.2 Santa Cruz County

3.6.2.1 Appleton-Whittell Research Ranch

The Appleton-Whittell Research Ranch is a collaboration among the National Audubon Society, USFS, BLM, Appleton family, and the Research Ranch Foundation. The Research Ranch is an 8,000-acre refuge located near Elgin. The Research Ranch was established in 1968 by the Appleton family for ecological research and has not been grazed by cattle since 1968. The undisturbed habitat consists of semidesert grasslands, oak savannah, oak woodland, and riparian systems (National Audubon Society 2000).

3.6.2.2 Canelo Hills Cienega

Canelo Hills Cienega is located 14 miles south of Sonoita and is managed by TNC (TNC 2000a). The preserve, once part of a "working ranch," includes 260 acres of rolling black oak and Arizona fescue "savannas" with small isolated riparian wetlands in the draw bottoms. O'Donnell Creek is a small perennial stream running through the Canelo Hills Cienega and supports one of the largest populations of the Gila chub and the Canelo Hills ladies' tresses, both endangered species.

3.6.2.3 Coronado National Forest

As discussed previously, the Coronado National Forest covers 2,475,000 acres of southeastern Arizona and southwestern New Mexico (USFS 2000a). Two Wilderness Areas, the Pajarita and Mt. Wrightson, and one Research Natural Area (RNA), the Goodding, are found within the Coronado National Forest in Santa Cruz County.

- Pajarita Wilderness Area**:** Congress designated the Pajarita Wilderness Area in 1984 and it now has a total of 7,553 acres (NWPS 2000e). More than 660 species of plants have been identified within its borders, 17 of them indigenous. Located near the US-Mexico border, Pajarita is dominated by the narrow and twisting, steep-walled Sycamore Canyon. Although the flows that occur in Sycamore Canyon are ephemeral, the canyon does have year-round pools of water and serves as a major migration corridor for wildlife. Elevations of the Wilderness Area range from 3,800 feet msl to 4,800 feet msl.

- Mt. Wrightson Wilderness Area: Mt. Wrightson Wilderness Area is located 30 miles southeast of Tucson at the core of the Santa Rita Mountains. It has a total of 25,260 acres and is visible from Tucson at 9,452 feet msl in elevation. This Wilderness has rough hillsides, deep canyons, and lofty ridges and peaks surrounded on all sides by semiarid hills and sloping grasslands and is dominated by Ponderosa pine and Douglas fir. The stream-fed canyons support an abundance of plant and animal life, including many montane Mexican plants that grow nowhere else north of the border (NWPS 2000d).

- Goodding RNA**:** This RNA was established in 1970 and encompasses 545 acres with elevations ranging from 3,800 to 4,500 feet msl (USFS 2000b). It is located just north of the US-Mexico border, 15 miles west of Nogales, Arizona and lies within the Pajarita Wilderness Area. The riparian system associated with the intermittent stream flowing through the RNA supports habitat for a number of rare animals. The RNA is the only known location where three species of leopard frogs have co-occurred: Tarahumara leopard frog (*Rana tarahumare*) (extripated), Chiricahua leopard frog, and lowland leopard frog (*Rana yavapainensis*). Bird diversity is high in the area, and the RNA supports the lowest elevation nesting location for the Mexican spotted owl. Perennial waters support rare fish including the Sonoran chub.

- Madera Canyon Recreation Area: Madera Canyon is located 43 miles south of Tucson at an elevation of 4,600 feet amsl in the Santa Rita Mountains (USFS 2004a). Because

of the year-round water to be found here, Madera Canyon attracts a wide variety of bird species. More than a dozen species of hummingbirds, an equal number of flycatchers, warblers, tanagers, buntings, grosbeaks, and many rare birds not found in in any other state frequent Madera Canyon (Frommers 2003).

- Pena Blanca Recreation Area: Pena Blanca Lake is a 45-surface-acre lake located 63 miles south of Tucson at an elevation of 4,000 feet amsl in the Atascosa Mountain foothills (USFS 2004b). The recreation area is located at an environmental transition zone where desert cactus and oak and mesquite thickets both grow (Desert USA 2004). This area is valued by the recreating public for its birdwatching, hiking, and photography opportunities.

3.6.2.4 Empire-Cienega Ranch

Since 1988, the Empire and Cienega ranches have been under the administration of the BLM under the principles of multiple-use and ecosystem management. The Empire-Cienega RNA is a working cattle ranch of 45,000 acres of public land located in southeastern Pima County and northeastern Santa Cruz County. The diversity of habitat in this RNA supports healthy populations of fish and wildlife. Three species of native fish are found in the Cienega Creek: Gila topminnow, Gila chub, and longfin dace. A variety of amphibians and reptiles are found in the RNA and nearly 200 bird species have been identified. Numerous game and non-game mammals are found in the RNA, including 11 species of bats. The field station is located 46 miles southeast of Tucson and 10 miles north of Sonoita. The station is accessed by SR 83, 7 miles north of Sonoita, and by SR 82, which is 5 miles east of Sonoita (BLM 2000c).

3.6.2.5 Patagonia Lake State Park

Patagonia Lake State Park is located approximately 12 miles northeast of Nogales and 20 miles southwest of Sonoita on SR 82 (ASP 2000b). The lake is 2.5 miles long and approximately 250 acres and was created by damming Sonoita Creek, which flows 2.5 miles along the edge of the park. The lake is stocked every winter with bass (*Micropterus sp.*), crappie (*Pomoxis sp.*), bluegill (*Lepomis macrochirus*), and catfish. The new Sonoita Creek State Natural Area is located in the northeastern portion of the park and the Patagonia/Sonoita Creek Preserve is located near the northwestern portion of the park.

3.6.2.6 Patagonia/Sonoita Creek Preserve

The Patagonia/Sonoita Creek Preserve is located near Patagonia. This 850-acre preserve is managed by TNC. It is located in the floodplain valley between the Patagonia and Santa Rita Mountains and provides a rich habitat of cottonwood-willow riparian forest supporting a wide array of wildlife (TNC 2000b). Over 290 bird species are found here, as well as other animal

species including the mountain lion, bobcat (*Felis rufus*), white-tailed deer (*Odocoileus virginianus*), javelina (*Pecari angulatus*), coatimundi, coyote (*Canis latrans*), desert tortoise (*Gopherus agassizii*), occasional rattlesnakes and several toads and frogs.

3.6.2.7 Tubac Presidio State Historic Park

Tubac Presidio State Historic Park is Arizona's first state park (ASP 2000c) and encompasses 11 acres. It is located 45 miles south of Tucson near the community of Tubac. Remnants of the military fort founded by the Spanish in 1752 have been uncovered by University of Arizona archeologists and preserved by Arizona State Parks. An underground display features portions of the original foundation, walls, and plaza floor of the Presidio (fort) de San Ignacio de Tubac.

3.6.2.8 Tumacacori National Historic Park

Tumacacori National Historical Park is located in the Santa Cruz River Valley 48 miles south of Tucson (NPS 2000e). The 45-acre park is the site of one of the oldest Spanish missions in the southwest.

3.6.2.9 Wild Chile Botanical Area

The Wild Chile Botanical Area is a special management area within the Coronado National Forest. This 2500-acre area is designed to conserve wild relatives of the wild chile, an economically important crop. Through research, training and education, the botanical area provides government, non-government and private interests the opportunity to work together toward the common goal of conserving our natural resources (Native Seeds/Search 2002).

3.6.3 Pima County

3.6.3.1 Baboquivari Peak Wilderness Area

Congress designated the Baboquivari Peak Wilderness Area in 1990, and it now has a total of 2,040 acres (NWPS 2000a). It is Arizona's smallest designated Wilderness Area and is managed by the BLM. Elevations range from 7,730 feet amsl on the summit to 4,500 feet amsl on the desert floor. Vegetation in the higher country includes oak, walnut, and piñon; saguaro, paloverde, and other chaparral species are found on the lower elevations.

3.6.3.2 Buenos Aires National Wildlife Refuge

The Buenos Aires National Wildlife Refuge (BANWR) is an 115,000-acre refuge established to preserve the endangered masked bobwhite quail (*Colinus virginianus ridgwayi*) (USFWS

2000a). It is located in the southeast corner of Pima County, near Sasabe. It contains extensive grasslands, seasonal streams, and a lake. Over 300 species of birds, including hawks, herons, vermilion flycatchers (*Pyrocephalus rubinus*) and golden eagles (*Aquila chrysaetos*) (during migration) are found on this refuge. Other wildlife includes coyotes, deer, foxes, and pronghorn. In addition to the masked bobwhite quail, BANWR protects habitat for five other endangered species (cactus ferruginous pygmy-owl, Pima pineapple cactus, Kearney's blue star, southwestern willow flycatcher, and razorback sucker).

3.6.3.3 Cabeza Prieta National Wildlife Refuge (CPNWR)

The CPNWR is located along 56 miles of the US-Mexico border between Yuma and Ajo, in both Yuma and Pima counties. It encompasses 860,000 acres of Sonoran Desert habitat consisting of low mountain ranges separated by broad alluvial valleys and is the third largest national wildlife refuge in the lower 48 states (USFWS 2000b). Under the 1990 Arizona Desert Wilderness Act, more than 803,000 acres of the refuge were classified as Wilderness Areas. The endangered Sonoran pronghorn, cactus ferruginous pygmy-owl, and lesser long-nosed bat are found on this NWR, as well as desert bighorns, lizards, rattlesnakes, and desert tortoises. As many as 391 plant species and more than 300 species of wildlife are found on the CPNWR.

3.6.3.4 Coyote Mountains Wilderness Area

Congress designated the Coyote Mountains Wilderness Area in 1990 and it now has a total of 5,080 acres (BLM 2000a). It is located 40 miles southwest of Tucson and is managed by the BLM. The Wilderness Area includes the Coyote Mountains, which cover about 40 percent of the total Wilderness Area. The vegetation includes paloverde, saguaro, chaparral, and oak woodlands. Currently there is no legal public access to the Coyote Mountains Wilderness Area.

3.6.3.5 Kitt Peak National Observatory

Kitt Peak National Observatory is located 44 miles southwest of Tucson at an elevation of 6,875 feet amsl (NOAO 2000). The observatory began operating in 1960 and is administered by the Association of Universities for Research in Astronomy and the National Optical Astronomy Observatories (NOAO).

3.6.3.6 Organ Pipe Cactus National Monument (OPCNM)

The OPCNM is located along the US-Mexico border in the southwestern portion of Arizona. It runs 40 to 50 miles from both east-to-west and north-to-south, encompassing some 500 square

miles (NPS 2000c). Most of the Monument is situated between the Ajo Mountain Range to the east and the Puerto Blanco Mountains to the west, with the Senita Plain extending west from here into the CPNWR. The OPCNM Monument was established as a monument in 1937 and as an International Biosphere Reserve in 1976. It is an almost pristine example of the Sonoran Desert, totaling 330,689 acres. The Monument was established to protect the rare organ pipe cactus and 26 other cacti species, as well as more than 200 species of birds and other animals, many of which are unique to this area. Three distinctive divisions of the Sonoran Desert converge here, representing six plant communities.

3.6.3.7 Saguaro National Park

Saguaro National Park is comprised of two regions, Saguaro East and Saguaro West, located 30 miles apart on either side of Tucson in the Tucson Basin (NPS 2000d). The basin is situated in the Sonoran Desert between two mountain ranges, the Rincon Mountains and the Tucson Mountains. It encompasses 91,116 acres and is managed by the NPS. More than 2,700 plant species, including 50 varieties of cacti, are found in Saguaro National Park. The park's most prominent feature is the saguaro cactus, which is indigenous to the Sonoran Desert.

3.6.4 Yuma County

3.6.4.1 Eagletail Mountains Wilderness Area

Eagletail Mountains Wilderness Area has a total of 97,880 acres and is located 65 miles west of Phoenix, in Maricopa, Yuma, and LaPaz counties (BLM 2000b). Managed by the BLM, the wilderness includes 15 miles of the Eagletail Mountains ridgeline and Courthouse Rock to the north, Cemetery Ridge to the south, and a large desert plain area between the two ridgelines.

3.6.4.2 Imperial National Wildlife Refuge (INWR)

The INWR is located 40 miles north of Yuma, with lands situated in both Yuma County, Arizona and Imperial County, California (USFWS 2000c). It is 30 miles long and encompasses 25,625 acres and protects the desert and the Colorado River ecosystem, including the last unchannelized portion of the Colorado River prior to entering Mexico. More than 15,000 acres of the INWR is federally designated as a Wilderness Area. The refuge is home to 268 species of birds, including the endangered Yuma clapper rail, southwestern willow flycatcher, and bald eagle. One special portion of the Colorado River is protected for the endangered razorback sucker.

3.6.4.3 Kofa National Wildlife Refuge (KNWR)

The KNWR is located 40 miles north of Yuma on the east side of Highway 95 (USFWS 2000d). The KNWR comprises 665,400 acres of Sonoran Desert, 516,300 of which are designated wilderness, and encompasses the Kofa and Castledome Mountain ranges. The desert bighorn sheep (*Ovis Canadensis nelsoni*) and the California palm, the only native palm in Arizona, are found on the KNWR. Notable wildlife species found in the area include the white-winged dove (*Zenaida asiatica*), desert tortoise, and desert kit fox (*Vulpes macrotis arsipus*). Approximately 800 to 1,000 bighorn sheep now live in the refuge. Other common bird species seen are the American kestrel, northern flicker (*Colaptes auratus*), Say's phoebe (*Sayornis saya*), cactus wren (*Campylorhynchus brunneicapillus*), phainopepla (*Phainopepla nitens*), and orange-crowned warbler (*Vermivora celata*).

3.6.4.4 Muggins Mountains Wilderness Area

The 7,711-acre Muggins Mountains Wilderness Area is located approximately 25 miles east of Yuma and is managed by the BLM (BLM 2000d). The most prominent summits are Muggins Peak at 1,424 feet amsl, Klothos Temple at 1,193 feet amsl, and Long Mountain at 914 feet amsl.

3.7 CULTURAL RESOURCES

3.7.1 Cultural History

The National Historic Preservation Act (NHPA), Section 106, requires Federal agencies to take into account the effects of their undertakings on historic properties and defines procedures governing Federal agencies' statutory responsibilities (16 U.S.C. §461, *et. seq.*). The implementing regulations for Section 106 of the NHPA are at 36 C.F.R. Part 800. Revisions to these procedures emphasized consultation with Native American tribes as part of the Section 106 process. In particular, Sec. 800.2(c)(3) of the revised regulations states that Federal agencies are required to consult not only with the State Historic Preservation Officer (SHPO) and/or the Tribal Historic Preservation Officer (THPO) (if one has been officially appointed), but also with relevant tribes that might claim cultural affinity in the area of the undertaking. Such consultations should occur on all Federal undertakings subject to Section 106 review, regardless of whether or not the undertaking is on tribal lands. As a result, the tribes must be given a reasonable opportunity to identify their concerns, advise on potential resources within the Area of Potential Effect (APE), including eligibility and provide input on project effects. The following tribes in Arizona claim cultural affinity to the study area: Ak-Chin Indian Community,

Gila River Indian Community, Tohono O'odham Nation, Hopi, Salt River Pima-Maricopa Indian Community, Yavapai, Zuni Pueblo, Cocopah, and Fort Yuma-Quechan (ASP 1999). Ongoing consultation is being conducted with the Native American tribes claiming to have cultural affinity throughout both the Section 106 and NEPA processes.

The archeology of the study area is quite detailed and relatively complex considering the various geographic and related cultural features. A broad overview of southern Arizona prehistory and previous investigations within the study area are presented in Appendix D. The predominance of the cultural history contained in the appendix comes directly from a baseline document developed for JTF-6 for Arizona (INS 1999b).

3.7.2 Ethnographic Resources and Tribal Concerns

The National Park Service defines an ethnographic resource as a site, structure, object, landscape, or natural resource feature assigned traditional legendary, religious, subsistence, or other significance in the cultural system of a group traditionally associated with it. Ethnographic resources include Traditional Cultural Properties (TCP). TCPs are resources associated with cultural practices and beliefs of a living community that are rooted in its history and are important in maintaining the continuing cultural identity of the community. TCPs may include archeological resources, locations of historic events, sacred areas, sources of raw material used to produce tools and sacred objects, topographic features, traditional hunting or gathering areas, and native plants or animals. Identification of these resources requires consultation with the appropriate Native American Tribes, which claim a cultural affinity to the area.

Consultation includes the identification of any TCPs, traditional Native American subsistence areas (such as Native American Ak-Chin fields) or other ethnographic resources that may exist within the project area.

Several Native American reservations also exist within the study area. Consultation with the THPO (if one has been officially recognized) of these reservation lands is also required where applicable. The following Native American reservations are within the area of operation: San Xavier, Fort Apache, Tohono O'odham, Ak-Chin, Gila River, Gila Bend, Cocopah, Fort Yuma, and Salt River (Figure 3-12).

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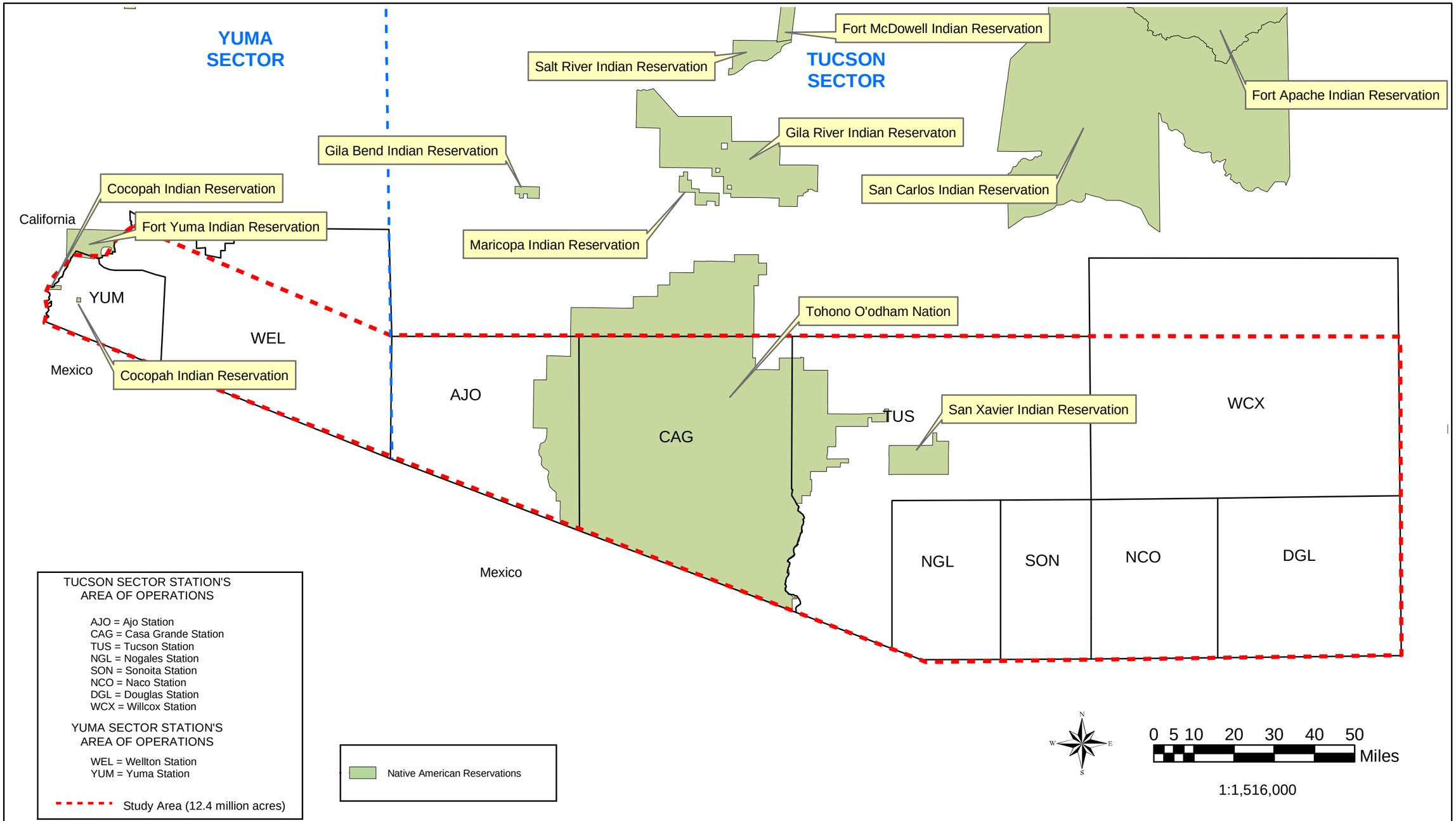

Figure 3-12: Native American Reservations within the Region of the Project Area

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3.7.3 Previous Investigations

Due to the great extent of the area of operation, a complete examination of the previous investigations conducted there is not possible. Previous investigations include academic and Section 106 compliance work that has been completed for multiple agencies including, but not limited to, the BMGR, USACE, Arizona Department of Transportation and Development (ADOTD), JTF NORTH and legacy INS. The multitude of previous archeological investigations resulted in the discovery of a vast array of sites in Arizona.

Cultural resources in southern Arizona vary greatly in size and configuration. Over 2,000 sites have been recorded within the AO. Lands controlled by BMGR occupy a large portion of the current AO. Numerous archeological surveys have been completed on BMGR lands between the mid-1950s through present day. A total of 41 cultural resources projects have been completed at the BMGR through the year 2000. The majority of these projects consist of intensive archeological surveys. This has resulted in over 135,600 acres being surveyed and the recording of over 1,000 sites. The present index of properties listed in the National Register of Historic Places (NRHP [Appendix E]) also represents a small proportion of those sites that may occur within the study corridor. At the present, this listing includes primarily historic mining communities, industrial complexes, and ranches. Only a few of the significant prehistoric properties within the study area are so listed.

3.8 WATER RESOURCES

3.8.1 Surface and Groundwater Resources

Surface water in the study area is located in the Lower Colorado Hydrologic Region which contains seven surface water basins: Upper Gila River, Willcox Playa, Rios de Mexico, San Pedro River, Santa Cruz River, Middle Gila River, and the southern Colorado River. The Willcox Playa Basin is a topographically closed basin that drains toward the interior. The Upper Gila River, San Pedro River, and Santa Cruz River basins drain into the Middle Gila River Basin, which subsequently drains into the Southern Colorado River Basin. The Rios de Mexico Basin, consisting of the Yaqui River and the Sonoran Drainage, drain south into Mexico. Various irrigation canals (*i.e.*, Wellton, Mohawk, B East Main, and West Main) have been installed along the Lower Gila and Lower Colorado Rivers in Yuma County for agricultural and drinking water supplies. The Colorado River and groundwater supply most of the potable water to the study area (USDOI 1977; Anderson and White 1986; Eden and Wallace 1992).

Other important surface water features of the study area include ephemeral waters such as springs, seeps, and tinajas. Tinajas are depressions carved out of a streambed by infrequent flash floods. These rockpools in arid regions provided oases for ancient peoples and desert travelers and often support local and unique populations of plant, animals, and invertebrates. Also important are man-made freshwater habitats such as artificial reservoirs (presas), farm ponds (estangues), and cattle tanks (charcos) (*e.g.*, irrigation on CPNWR for habitat enhancement). Irrigated plots have been established on the CPNWR to enhance forage for wildlife. These habitats create aquatic communities with varying degrees of water permanence in arid parts of the study area study areathat would otherwise lack surface water (Brown 1994).

The majority of the usable groundwater supply within the study area originates in alluvial aquifers that are confined and unconfined systems consisting of sand, gravel, silt, and clay. These aquifers range in depth from 100 to 2,000 feet below the ground surface with yields at large capacity wells averaging 1,000 gallons per minute with maximum yields exceeding 2,500 gallons per minute (White and Anderson 1985; Konieczki and Wilson 1992). Two Federally designated sole source aquifers are located within the AO: the Bisbee-Naco in Cochise County was designated September 30, 1988 (53 FR 38337) and the Upper Santa Cruz and Avra-Altar Basin in Santa Cruz and eastern Pima counties was designated January 24, 1984 (49 FR 2948) (US Environmental Protection Agency [USEPA] 1999).

The water supply of the Upper San Pedro Basin is of concern, especially in the Sierra Vista Area. The central feature of the San Pedro Basin is the San Pedro River, which originates in Mexico near the City of Cananea, flows northward and becomes a tributary to the Gila River in southern Arizona. The San Pedro River extends from about 23 miles south of the US-Mexico border to about 74 miles north of the border. At “The Narrows,” near the town of Benson, the San Pedro becomes divided into upper and lower basins. The river is mostly ephemeral and flows primarily in response to local rainfall. The Upper San Pedro Basin is an intermountain valley of about 1,875 square miles (28 percent lies in Mexico and the remaining 72 percent lies in the US) bounded on the west by the Huachuca, Whetsone, and Rincon Mountains, and on the east by the Mule, Dragoon, Little Dragoon, and Winchester Mountains. The Upper San Pedro basin currently contains an estimated 56,700,000 acre-feet of water in aquifer storage (EEC 2002). The deficit in the Upper San Pedro basin is estimated at 7,000 acre-feet per year (Center for Biological Diversity 2004).

Base flow in the San Pedro River is provided by groundwater discharge from the upper and lower valley fill and the Holocene alluvium. Base flow is of concern because summer base flow has declined from approximately 2.5 to 5.0 cubic feet per second (cfs) prior to 1963 to 0.4 to 3.3 cfs after 1982 (Pool and Coes 1999). Groundwater supports base flow in the San Pedro River from both sides of the basin in the upper reaches (Palominas and Sonora, Mexico, etc.), but southward most of the recharge supporting base flow originates in the Mule Mountains on the east side of the basin (Pool and Coes 1999). Recharge from the west side of the basin is partially intercepted by pumping at Fort Huachuca and Sierra Vista.

Seepage studies by the USGS during 1969 and 1970 indicated that the San Pedro River loses 1.7 cfs streamflow (infiltration of the alluvial aquifer) between the US-Mexico border and Palominas. The river then gains 8.5 cfs (streamflow is augmented by groundwater discharge from Palominas to Charleston), and loses 0.4 cfs in the river reach from Charleston to the mouth of the Bobocomari River near Fairbank (Freethey 1982). The gains and losses suggest that there are surface and groundwater withdrawals in the Palominas area and in Mexico, probably for mining and agricultural purposes that are influencing stream flow near the US-Mexico border. The stream losses near Fairbank may reflect the large cones of depression resulting from groundwater withdrawal at Fort Huachuca and Sierra Vista.

Another possible factor that may be reducing the base flow of the San Pedro is the increasing area of the entrenchment alluvium (unconsolidated soil in the upper alluvium of the stream bed). A series of large floods, perhaps beginning as early as 1881, eventually led to the entrenchment of a channel 3 to 35 feet below the former extensive floodplain. Prior to these events, the San Pedro River flowed in a shallow narrow channel in inner valley terrace deposits accumulated between A.D. 1450 and 1900. During this period, the river was a relatively sluggish, low-energy fluvial system with extensive marshy reaches and a high water table (Hereford 1993).

The cause of flooding around 1890 is poorly understood but is probably related to extensive wood cutting for mine timber and fuel, the introduction of large cattle herds, and unusually heavy rainfall (Hereford 1993). The entrenchment alluvium acts as a very large drain pipe buried just below the bottom of the channel that short-circuits surface flow downstream to the end of the entrenched alluvium. If there was a large volume of base flow, this short-circuiting may not be important; but, when base flow is small it can be a direct cause of reduced flow and extended

no-flow periods in that reach of the river and upstream. This drainpipe effect is greatest between the Town of Hereford and the Lewis Springs-Palominas areas.

3.8.2 Waters of the US and Wetlands

Section 404 of the Clean Water Act (CWA) of 1977 (P.L. 95-217) authorizes the Secretary of the Army, acting through the Chief of Engineers, to issue permits for the discharge of dredged or fill material into the navigable waters of the US, including wetlands (33 U.S.C. §1344). Waters of the US are all waters used in interstate or foreign commerce, subject to ebb and flow of tide, and all interstate waters including interstate wetlands. Waters of the US also include all other waters such as intrastate lakes, rivers, streams, mudflats, sandflats, wetlands, sloughs, prairie potholes, wet meadows, playa lakes, natural ponds, or impoundments of waters, tributaries of waters, and territorial seas (33 C.F.R. §328.3(a)(1-7)). Wetlands are those areas inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 C.F.R. §328.3(b)). Jurisdictional boundaries for these water resources are defined in the field as the "ordinary high water mark" which is that line on the shore established by the fluctuations of water and indicated by physical characteristics such as clear, natural lines impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas (33 C.F.R. §328.3(e)).

The United States Army Corps of Engineers (USACE) acting under Section 404 of the CWA, provides a vital function in protecting our valuable aquatic resources, including wetlands. The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters. Under Section 404 of the Clean Water Act, the Secretary of the Army is responsible for administering a regulatory program that requires permits for the placement of dredged or fill materials into waters of the US, including wetlands.

The Supreme Court ruling in Solid Waste Agency of Northern Cook County (SWANCC) v. USACE (531 US159 (2001)) limited the regulatory authority of the USEPA and USACE under the CWA. This ruling eliminates the CWA jurisdiction over isolated, non-navigable, and intrastate waters used as habitat by migratory birds. Waters of the US specifically affected by the SWANCC ruling include: small intrastate lakes, isolated rivers and streams (including

intermittent streams), isolated wetlands, sloughs, prairie potholes, wet meadows, playa lakes, or natural ponds.

The USACE has established nationwide permits (NWPs) to efficiently authorize common activities, which do not significantly impact waters of the US The NWPs were modified and reissued by the USACE in the *Federal Register* on January 15, 2002 and became effective on March 18, 2002. The USACE has the responsibility to authorize permitting under a NWP, or to require an individual permit.

While there are many wetland types in the arid southwestern US, water is scarce and local wetlands have experienced years of intensive use, modification, degradation, and more recently, efforts at conservation. Wetland types within the study area include riverine and riparian ecosystems (many of which are spatially and/or temporally intermittent), playa lakes (*e.g.*, Willcox Playa), artificial reservoirs, desert springs, and cienegas. Stream-riparian ecosystems are the predominant form of wetlands in this region and the most highly valued. Current efforts to manage and conserve these habitats for a variety of uses are underway. Disturbance of wetlands takes many forms; flash flooding and extensive drying are probably most influential. However, siltation, cattle grazing, algal pathogens, and various human effects such as water diversion, groundwater withdrawal, introduction of exotic species, and recreational uses may have strong effects.

3.8.3 Water Quality

The Arizona Department of Environmental Quality (ADEQ) has undertaken a comprehensive water quality assessment prepared in fulfillment of Section 305(b) of the CWA (ADEQ 1998). This endeavor was performed concurrently with the Arizona Unified Watershed Assessment (ADEQ 1998) and the ADEQ Source Water Assessment (ADEQ 1998). These programs are an integral part of a comprehensive statewide watershed management strategy implemented by the ADEQ and its Water Quality Division. Objectives included within this strategy are 1) Aquifer Protection Program Permits; Wastewater Reuse; and Dry Well Registration; 2) CWA Section 305(b) Water Quality Assessment Report; 3) Triennial Standards Review; 4) Site-Specific Standards Determination; 5) CWA Section 303(d) Listing of Quality-limited (Impaired and Threatened) Waters and Development and Implementation of Total Maximum Daily Loads (TMDL); 6) Safe Drinking Water Act Source Water Assessment, Protection Programs, and Public Water System Supervision (ADEQ, 1998).

Water quality monitoring of surface resources is accomplished through four programs in Arizona:

- ADEQ Fixed Station Network – sites selected and monitored to provide data on long-term conditions and trends on wadeable streams
- USGS Monitoring Stations – collects long-term data on major rivers and streams
- ADEQ Clean Lakes Program – collects monitoring data on lakes
- The ADEQ Biocriteria Development Program – monitors pristine, wadeable, perennial waters to use as reference sites for biocriteria

The ongoing assessment of surface waters includes portions of the area of operation. Assessed waters, their designated uses, assessment category, use support status, and assessments are summarized in Table 3-6.

3.9 AIR QUALITY

Section 109 of the Clean Air Act of 1970 (42 U.S.C. §7401, *et seq.*), as amended, directed the USEPA to establish National Ambient Air Quality Standards (NAAQS) for air pollutants that endanger public health or welfare (42 U.S.C. §7409). The USEPA defines ambient air in 40 C.F.R. §50.1(e) as "that portion of the atmosphere, external to buildings, to which the general public has access." In 40 C.F.R. Part 50, USEPA has designated "criteria air pollutants" in which ambient air quality standards have been established. Ambient air quality standards are intended to protect public health and welfare and are classified as either "primary" or "secondary" standards. Primary standards define levels of air quality necessary to protect the public health (40 C.F.R. §50.2(b)). National secondary ambient air quality standards define levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Primary and secondary standards have been established for carbon monoxide (CO), lead, ozone (O_3), nitrogen dioxide (NO_2), particulate matter (total and inhalable fractions) and sulfur dioxide (SO_2). Areas that do not meet these standards are called "non-attainment" areas; areas that meet both primary and secondary standards are known as "attainment" areas. The Clean Air Act (CAA) requires that for areas designated as non-attainment, plans must be prepared and implemented to bring the area into attainment within a specified time.

The majority of the Arizona portion of the US-Mexico border area is sparsely settled desert or semi-desert with the exception of two large areas of urbanization, the Phoenix and Tucson metropolitan areas. Several "sister cities" are also located along the US-Mexico border. There

Table 3-6. Water Quality, Designated Uses, Assessment Category, and Use Support Status for Watersheds within the Area of Operation.

Segment Name/ County Located	ID Number	Miles/Acres in Segment	Designated Uses	Assessment Category	Use Support/ Water Quality Limited	Assessment Narrative
Colorado River: Indian Wash – Imperial Dam/ La Paz & Yuma Co.	15030104 -001	17 miles	A&Ww, FBC, FC, DWS, AgI, AgL	Monitored	Full/No	High Sulfate and TDS
Colorado River – Yuma Wash/Yuma Co.	15030104 -008	22 miles	A&Ww, FBC, FC, DWS, AgI, AgL	Evaluated	Partial/No	Selenium levels in some samples
Colorado River: Main Canal – Mexico Border/Yuma Co.	15030107 -001	32 miles	A&Ww, FBC, FC, AgI, AgL	Monitored	Parital/Yes	High turbidity, metals and pesticides in some samples
Gila River: Coyote Wash – Fortuna Wash/Yuma Co.	15070201 -003	28 miles	A&Ww, FBC, FC, AgI, AgL	Monitored	Non/Yes	High metals, TDS, and turbidity
Wellton-Mohawk Canal/Yuma Co.	15070201 -301	15 miles	DWS, AgI, AgL	Evaluated	Threat/No	High copper, DDT metabolites, and toxaphene in some samples
Imperial Reservoir/ Yuma Co.	15030104 -0670	513 acres	A&Ww, FBC, FC, DWS, AgI, AgL	Evaluated/ Unknown	Partial/No	High TDS and sulfates; selenium in some samples
Mittry Lake/ Yuma Co.	15030107 -0950	384 acres	A&Ww, FBC, FC	Evaluated/ Unknown	Partial/No	Selenium in some samples
SANTA CRUZ RIVER/RIO MAGDELENA/RIO SONOITA WATERSHED						
Harshaw Wash/Santa Cruz Co.	15050301 -268	14 miles	A&Ww, FBC, FC, AgI, AgL	Monitored	Full/No	High cromium and zinc in some samples
Madera Canyon Creek/Pima Co.	1500301- 322	13 miles	A&Ww, FBC, FC, AgL	Evaluated	Full/No	Use impaired
Alum Gulch/Santa Cruz Co.	1500301- 561A	2 miles	A&Ww, FBC, FC, AgL	Evaluated	Non/Yes	Use impaired by high metals, low pH
Redrock Canyon Creek/ Santa Cruz Co.	15050301 -576	13 miles	A&Ww, FBC, FC	Evaluated	Full/No	Use impaired
Cienega Creek/ Santa Cruz and Pima Co.	15050302 -006A	37 miles	A&Ww, FBC, FC, AgL	Evaluated	Full/No	Use impaired
Cienega Creek/Pima Co.	15050302 -006B	11 miles	A&Ww, FBC, FC, AgL	Monitored	Full/No	Use impaired
Arivaca Creek/Pima Co.	15050304 -008	15 miles	A&Ww, FBC, FC, AgL	Monitored	Full/No	Low dissolved oxygen during low flow
Sycamore Canyon/Pima Co.	15080200 -002	10 miles	A&Ww, FBC, FC, AgL	Evaluated	Full/No	Low dissolved oxygen during low flow

Table 3-6, continued

Segment Name/ County Located	ID Number	Miles/Acres in Segment	Designated Uses	Assessment Category	Use Support/ Water Quality Limited	Assessment Narrative
Patagonia Lake/Santa Cruz Co.	1505030 1-1050	231 acres	A&Wc, FBC, FC, DWS, AgI, ASgL	Evaluate, eutrophic	Threat/No	High nutrients indicated by aquatic vegetation; mercury in some samples
Pena Blanca Lake/Santa Cruz Co.	1505030 1-1070	51 acres	A&Wc, FBC, FC, DWS, AgI, AgL	Monitored, eutrophic	Non/Yes	High mercury in some samples
Arrivac Lake/Pima Co.	1505030 4-0080	118 acres	A&Ww, FBC, FC, AgL	Evaluated, eutrophic	Non/Yes	High mercury in some samples and high nutrients
SAN PEDRO RIVER/WILCOX PLAYA/RIO YAQUI WATERSHED						
San Pedro River: Dragoon Wash – Tres Alamos Wash/Cochise Co.	1505020 2-003	17 miles	A&Wx, FC, FBC, AgL	Monitored	Non/Yes	Fecal coliform, turbidity, nitrate impairs uses
San Pedro River: Babocmari Creek – Dragoon Wash/Cochise Co.	1505020 2-003	17 miles	A&Wx, FC, FBC,AgL	Monitored	Non/Yes	Fecal coliform and turbidity impairs uses, high beryllium in some samples
Babocomari Creek/ Cochise Co.	1505020 2-004	33 miles	A&Ww, FC, FBC, AgL	Evaluated	Full/No	Use impaired
San Pedro River: Charleston – Walnut Gulch/Cochise Co.	1505020 2-006	9 miles	A&Ww, FC, FBC, AgI, AgL	Evaluated	Full/No	Use impaired
San Pedro River: Mexico border – Charleston/Cochise Co.	1505020 2-008	28 miles	A&Ww, FC, FBC, AgI	Monitored	Partial/Yes	Turbidity impairs uses; high metals in some samples
Whitewater Draw/Cochise Co.	1508030 1-002	6 miles	A&Wx, FC, FBC, AgI, AgL	Evaluated	Non/Yes	Use impaired by high beryllium, low dissolved oxygen, lead, and turbidity. Other metals detected in some samples
Mule Gulch headwaters – Bisbee WWTP/Cochise Co.	1508030 1-090A	1 mile	A&Ww, FC, FBC, AgI, AgL	Evaluated	Partial/No	Use impaired by low pH
Mule Gulch: Bisbee WWTP – Whitewater Draw/Cochise Co.	1508030 1-090B	8 miles	A&Wedw, PBC, AgL	Evaluated	Non/Yes	Uses impaired by zinc, copper, low pH, and turbidity
Rucker Canyon Creek – Whitewater Draw/Cochise Co.	1508030 1-288	10 miles	A&Wc, FC, FBC, DWS, AgL	Evaluated	Full/No	Use unimpaired
Wilcox Playa/Cochise Co.	1505020 1-1892	29,471 acres	A&Ww, FBC, FC, AgL	Evaluated/Unknown	Threat/No	Use threatened by arsenic, beryllium, cadmium, and turbidity.

Table 3-6, continued

Segment Name/ County Located	ID Number	Miles/Acres in Segment	Designated Uses	Assessment Category	Use Support/ Water Quality Limited	Assessment Narrative
SAN CARLOS/SAFFORD/DUNCAN WATERSHED						
East Turkey Creek – San Simon Wash/Cochise Co.	15040006 -837	14 miles	A&Wc, FC, FBC, AgL	Evaluated	Full/No	Use unimpaired
Cave Creek South Fork/Cochise Co.	1504006-849	22 miles	A&Wc, FC, FBC, AgI, AgL	Evaluated	Full/No	Use unimpaired
Cave Creek/Cochise Co.	15040006 -852A	9 miles	A&Wc, FC, FBC, AgI, AgL	Evaluated	Full/No	Use unimpaired

Source: ADEQ Water Quality Assessment, 1988.

Legend:

FC= Fish Consumption

FBC= Full Body Contact

PBC = Partial Body Contact

DWS= Domestic Water Supply

A&W= Aquatic and Wildlife

c= Cold Water

w= warm water

AgI= Agricultural Irrigation

AgL= Agriculture and Livestock Watering

Full= segment fully supports designated uses

Non= segment does not support designated uses

Partial= segment partially supports designated uses

Threat= designated uses threatened by identified pollutants

Yes= water quality in this segment is limited

No= water quality is not limited or threatened.

are a number of air quality problems related to the rural, urban, and industrial areas within this AO. Man-made sources of air contaminants affect the air quality of the AO. These sources include industrial emissions, mobile (vehicular) emissions, area emissions (*e.g.*, emissions from numerous residences and small commercial establishments in an urban setting), dust resulting from wind erosion of agriculturally disturbed lands, smoke from forestry burns, and pollutants transported into the study area on winds blowing from major urban/industrial areas outside the area.

Airborne particulates are a special problem in the border area. Construction activity and windblown dust from disturbed desert are significant sources of fugitive dust. In agricultural areas, farming activity is an additional source of fugitive dust. Many residences in the US-Mexico border area burn non-traditional fuels such as wood scraps, cardboard, and tires to provide warmth in the winter. The resulting particulate loading can also adversely affect air quality in the Arizona border counties.

In addition to airborne particulates, high concentrations of SO_2 in the study area are of concern. SO_2 is the primary contributor to acid deposition, which causes acidification of lakes and streams and can damage trees, crops, historic buildings, and statues. In addition, SO_2 compounds in the air contribute to visibility impairment and may affect breathing and aggravate existing respiratory and cardiovascular disease (USEPA 2000). Ambient SO_2 in the study area results largely from stationary sources such as coal and oil combustion, steel mills, refineries, pulp and paper mills, and from nonferrous smelters.

3.9.1 Potential Sources of Air Pollutants

The emission sources of those criteria pollutants regulated by the NAAQS are of concern nationally, statewide and regionally. Ambient concentrations of CO are predominantly influenced by mobile source emissions. Emissions of SO_2 are associated mainly with stationary sources. Ozone, lead, nitrogen oxides (NO_x), Volatile Organic Compounds (VOCs), total suspended particulates (TSP) and inhalable particulate matter (PM_{10}/$PM_{2.5}$) come from both mobile and stationary sources.

CO is a colorless, odorless gas that results from the incomplete combustion of gasoline and other fossil fuels and impairs the ability of blood to carry oxygen in the body. In most cities, approximately 80 percent of CO emissions are from motor vehicles. Because CO disperses

quickly; the concentrations can vary greatly over relatively short distances. Elevated concentrations are usually limited to locations near crowded intersections and long heavily congested roadways. Consequently, it is important to evaluate CO concentrations on a localized basis to determine the impacts from the proposed project.

O_3, also an odorless and colorless gas, is a major constituent of photochemical smog at the earth's surface. Research has indicated that O_3 damages the respiratory system, reducing breathing capacity and causing chest pain, headache, nasal congestion, and sore throat. Individuals with chronic respiratory diseases are especially susceptible to O_3. In addition, high levels of O_3 can cause injuries to certain plants, trees, and materials. The precursors in the formation of O_3 are VOCs and NO_x. In the presence of sunlight, O_3 is formed through a series of photochemical reactions that take place in the atmosphere. Because reactions occur as the pollutants are diffusing downward, elevated O_3 levels are often found many miles from sources of the precursor pollutants. Therefore, the effects of NO_x and VOC emissions from mobile sources are examined on a regional basis. The change in regional mobile source emissions of these pollutants is related to the total number of vehicle miles travels (VMT) throughout the AO.

Inhalable particulates are emitted from various sources: industrial facilities, power plants, construction activities, diesel-powered vehicle, unimproved roads, and open burning. The pollutants can cause irritation and damage to the respiratory systems, resulting in difficult breathing, inducement of bronchitis, and aggravation of existing respiratory diseases. Also, certain polycyclic aromatic hydrocarbons in particulate matter may be carcinogenic. Individuals with respiratory and cardiovascular diseases, children, and elderly persons are at greatest risk. Secondary effects include dust settling, damaging materials, and impairment of visibility.

SO_2 emissions are primarily associated with the combustion of sulfur-containing fuels, oil and coal. Exposure to high levels of SO_2 aggravates asthma, resulting in wheezing, shortness of breath, and coughing. Secondary effects include visibility impairment and acid deposition due to its conversion to sulfate particles.

Lead emissions are primarily associated with motor vehicle and industrial sources that use gasoline containing lead additives. All vehicles produced in the US after 1980 are designated to use unleaded fuel, and the ambient air concentration of lead has declined significantly since then.

3.9.2 Ambient Air Quality Monitoring/Status

The counties in the study area are within the Intrastate Air Quality Control Regions (IAQCR) for air quality planning purposes as follows: Cochise and Santa Cruz counties - Southeast Arizona IAQCR; Pima County - Pima IAQCR; and Yuma County to Mohave-Yuma IAQCR.

The State of Arizona has adopted the NAAQS as the state's air quality criteria. National standards (discussed in the following paragraphs) for air quality are presented in Table 3-7. Based upon a review of the USEPA nonattainment website (http://www.epa.gov/air/oaqps/greenbk/), portions of Pima County have been designated as non-attainment for the SO_2 and PM_{10} (suspended particulate matter less than ten microns) standards. Portions of Yuma County are also designated as non-attainment for the PM_{10} standard. The rest of the counties are designated as attainment/unclassifiable for all other criteria pollutant standards.

Existing air quality in the project region is monitored by a series of ambient air monitoring networks established and maintained by the state and local air pollution control agencies. On average, emissions from selected pollutants measured in tons per year along the US-Mexico border are as follows: SO_2 (4,663), NO_x (6,519), TSP (1,190), CO (689), and VOCs (45).

3.10 SOCIOECONOMICS

3.10.1 Population and Demographics

The region of influence (ROI) of the proposed actions consists of a 4-county area along the southern border in Arizona, including Cochise, Pima, Santa Cruz, and Yuma counties. The population and racial mixes of the different counties are presented in Table 3-8. Population in each of the counties ranges from 843,746 in Pima County in 2000 to 38,381 in Santa Cruz County in 2000. There was positive population growth in all counties within the ROI. This growth, between 1990 and 2000, ranged from 49.7 percent in Yuma County to 12.7 percent in Santa Cruz County. The racial mix of the area is predominated by Caucasians in all counties ranging from 77 percent in Cochise County to 68 percent in Yuma County. Both Santa Cruz County, and Yuma County have the majority of the population claiming to be of Hispanic origin, 81 percent and 50 percent respectively. Overall, the percentage of people claiming Hispanic origin has increased across the ROI between 1990 and 2000. For the most part, racial mix of the counties changed little between 1990 and 2000. A significant drop in the percentage of

Table 3-7. Ambient Air Quality Standards For Criteria Pollutants

Pollutant	Federal Standard
Carbon Monoxide (CO)	
Maximum 8-Hour Concentration	9 ppm*
Maximum 1 Hour Concentration	35 ppm
Lead (Pb)[2]	
Maximum Arithmetic Mean Over Three Consecutive Months	1.5 $\mu g/m^{3**}$
Nitrogen Dioxide (NO_2) [2]	
Annual Arithmetic Mean	0.05 ppm
1 Hour	
Ozone (O_3)[2]	
1-Hour Average	0.12 ppm
8-Hour Average	0.08 ppm
Total Suspended Particulates (PM)	
Annual Arithmetic Mean	75 $\mu g/m^3$
Maximum 24-Hour Concentration	250 $\mu g/m^3$
Inhalable Particulate Matter (PM_{10}) [2]	
Annual Arithmetic Mean	50 $\mu g/m^3$
Annual Geometric Mean	150 $\mu g/m^3$
Maximum 24-Hour Concentration	
Inhalable Particulate Matter ($PM_{2.5}$) [2]	
Annual Arithmetic Mean	15 $\mu g/m^3$
Maximum 24-Hour Concentration	65 $\mu g/m^3$
Sulfur Dioxide (SO_2)	
Annual Arithmetic Mean	
Maximum 24-Hour Concentration	80 $\mu g/m^3$
Maximum 3-Hour Concentration	365 $\mu g/m^3$
Maximum 1-Hour Concentration	1,300 $\mu g/m^3$
Visibility Reducing Particles	No Standard
Sulfates 24-Hour Concentration	No Standard
Hydrogen Sulfide 1-Hour Concentration	No Standard

NOTES:

1) Ambient air quality standards presented above based upon 40 C.F.R. Part 50.
2) Federal primary and secondary standards for this pollutant are identical.
3) Insufficient amount to produce an extinction coefficient of 0.23 per kilometer—visibility of ten miles or more due to particles when the relative humidity is less than 70 percent

* ppm = Parts per million

** $\mu g/m^3$ = Micrograms per cubic meter

Table 3-8. Population and Race Estimates within the Area of Operation

Location	White	African American	Asian	Native American	Hispanic Origin	Total	Population Density
Arizona							
1990	3,277,590 (89%)	114,960 (3%)	58,362 (2%)	214,427 (6%)	688,355 (19%)	3,665,339	32.3
2000	3,873,611 (75%)	158,873 (3%)	92,236 (2%)	255,876 (5%)	1,295,617 (25%)	5,130,632	45.2
2002	-	-	-	-	-	5,456,453	-
Cochise							
1990	89,282 (92%)	5,181 (5%)	2,298 (2%)	863 (1%)	28,379 (29%)	97,624 (3%)	15.8
2000	90,269 (77%)	5,321 (5%)	1,942 (2%)	1,350 (1%)	36,134 (31%)	117,755 (2%)	19.1
2002	-	-	-	-	-	120,295 (2%)	-
Pima							
1990	608,751 (91%)	21,951 (3%)	12,650 (2%)	23,605 (4%)	163,262 (24%)	666,957 (18%)	72.6
2000	633,387 (75%)	25,594 (3%)	17,213 (2%)	27,178 (3%)	247,578 (29%)	843,746 (16%)	91.8
2002	-	-	-	-	-	881,221 (16%)	-
Santa Cruz							
1990	29,296 (99%)	129 (<1%)	183 (<1%)	68 (<1%)	23,221 (78%)	29,676 (1%)	31.0
2000	29,168 (76%)	145 (<1%)	201 (<1%)	251 (1%)	31,005 (81%)	38,381 (1%)	31.0
2002	-	-	-	-	-	40,035 (1%)	-
Yuma							
1990	100,142 (94%)	3,345 (3%)	1,577 (1%)	1,831 (2%)	43,388 (41%)	106,895 (3%)	29.0
2000	109,269 (68%)	3,550 (2%)	1,486 (1%)	2,626 (2%)	80,772 (50%)	160,026 (3%)	29.0
2002	-	-	-	-	-	167,407 (3%)	-

Source: US Census Bureau, 2003b

Caucasian populations seems to be more of a result of changes in data collection between the 1990 and 2000 census, with the 2000 census dividing the population between those of one race or two or more races. The 2002 population estimates show a similar population distribution across the counties with the largest total population in Pima County (881,221) and the lowest in Santa Cruz County (40,035) (US Census Bureau 2003a). Racial breakdowns of 2002 population estimates were not available.

3.10.2 Employment and Income

Table 3-9 summarizes the total number of jobs in the study area split by county. Pima County had the largest numbers of jobs in the ROI while Santa Cruz had the lowest. Yuma County had the highest unemployment rate (23.8 percent) followed by Santa Cruz County (13.9 percent). Pima County (4.9 percent) and Cochise County (5.5 percent) were both below the state unemployment rate (US Census Bureau 2003a).

Table 3-10 summarizes the total personal income (TPI) for the ROI. TPI ranged from $21 billion in Pima County to $705 million in Santa Cruz County. The average annual growth rate over the

Table 3-9. Total Number of Jobs within the Area of Operation

Location	1991	2001	Percent Change	Unemployment Rate[1]
Arizona	**1,918,421**	**2,859,243**	**49%**	**6.2%**
Cochise	39,221	50,402	29%	5.5%
Pima	326,153	445,041	36%	4.9%
Santa Cruz	13,630	16,037	18%	13.9%
Yuma	53,905	70,598	31%	23.8%

[1]2002 Annual Average
Source: Bureau of Economic Analysis (BEA) 2003a; Arizona Department of Economic Security (ADES) 2003

Table 3-10. Total Personal Income for the Region of Influence

Location	1991 TPI (rank) (in $ billions)	2001 TPI (rank) (in $ billions)	Percent State Total	Average Annual Growth Rate
Arizona	**$25 (25th)**	**$138 (23rd)**	**100%**	**7.6%**
Cochise	$1.4 (7th)	$ 2.4 (8th)	1.8%	5.2%
Pima	$ 11.4 (2nd)	$ 21.4 (2nd)	15.6%	6.5%
Santa Cruz	$ 0.4 (12th)	$ 0.7 (12th)	0.5%	6.3%
Yuma	$ 1.6 (4th)	$ 2.8 (6th)	2.0%	5.7%

Source: BEA 2003b

past 10 years ranged from 6.5 percent in Pima County to 5.2 percent in Cochise County. The average annual growth rate of TPI for the US was 5.5 percent. All the counties within the ROI were below the average annual growth rate for TPI within Arizona (BEA 2003b).

Per capita personal income (PCPI) data for the ROI is located in Table 3-11. PCPI ranged from $24,767 in Pima County, Arizona to $16,839 in Yuma County. All the counties were below the national average of $25,288 with Pima County being the closest at 81 percent of the national average PCPI. The average annual growth rate of PCPI ranged from 3.9 percent in Pima County to 1.7 percent in Yuma County. The annual average growth rate of PCPI across the whole ROI was below the average annual growth rate of both the Nation (4.3 percent) and the State (4.0 percent) (BEA 2003b).

Poverty levels for all counties within the study area are presented in Table 3-12. Poverty estimates for the ROI range from 23.1 percent in Santa Cruz County to 13.5 percent in Pima County for people of all ages. Poverty estimates within the ROI are not only higher than the state average but they are also much higher than the national average of 11.9 percent (US Census Bureau 2003c).

Table 3-11. Per Capita Personal Income for the Region of Influence

Location	1991 PCPI (rank)	2001 PCPI (rank)	Percent of State Average	Percent National Average	Average Annual Growth Rate
Arizona	**$17,260 (37th)**	**$26,055 (38th)**	**--**	**85%**	**4.0%**
Cochise	$ 14,705 (6th)	$ 20,279 (6th)	78%	67%	3.3%
Pima	$ 16,819 (2nd)	$ 24,767 (2nd)	96%	81%	3.9%
Santa Cruz	$ 12,362 (12th)	$ 17,964 (10th)	69%	59%	3.8%
Yuma	$ 14,203 (9th)	$ 16,839 (11th)	65%	55%	1.7%

Source: BEA 2003b

Table 3-12. Number and Percent of People of All Ages in Poverty by County[1]

Location	Number	Percent
Arizona	643,045	12.8%
Cochise	19,021	17.0%
Pima	110,933	13.5%
Santa Cruz	8,834	23.1%
Yuma	33,874	21.9%

[1]Based on 1999 model
Source: US Census Bureau, 2003c

3.10.3 Housing

The report, *The State of Housing in Arizona*, produced by the Arizona Housing Commission in 2000, states that Arizona is currently going through a housing crisis where housing prices are rising twice as fast as income statewide. This is of particular importance to low income and minority households.

For both minority and non-minority households, the incidence of housing problems increases dramatically as income levels decrease. Since the percent of minority households that are low income far exceeds the proportionate number in the general population, minorities suffer disproportionately in terms of their basic need for adequate, affordable shelter. This is particularly alarming considering the growth rate of minority populations in Arizona (Arizona Housing Commission, 2000).

The total number of housing units in the ROI in 2000 was 505,039 (US Census Bureau, 2003d). Table 3-13 summarizes the total number of housing units by county. The largest number of housing units are located in Pima County while the smallest is located in Santa Cruz County. Santa Cruz and Pima counties have the smallest percentage of vacant units, while Yuma

County has the largest percentage of vacant housing units. Table 3-14 summarizes household growth trends by county for Arizona and average annual growth rate in median household income and house sales price between 1990 and 1995 for Arizona. The latter set of data came from *The State of Housing in Arizona*. The highest household growth is occurring in Yuma County, Arizona, while the lowest is occurring in Santa Cruz County. The largest discrepancy between median household income growth and house sales price growth occurs in Pima County. House sales prices are growing faster than median household income in all of the counties within the ROI except for Santa Cruz County.

Table 3-13. Housing Units by County (2000)

Location	Vacant Housing Units	Owner Occupied Housing Units	Renter Occupied Housing Units	Total Housing Units
Arizona	**287,862 (13%)**	**1,293,556 (59%)**	**607,771 (28%)**	**2,189,189**
Cochise	7,233 (14%)	29,523 (58%)	14,370 (28%)	51,126 (2%)
Pima	34,387 (9%)	213,603 (58%)	118,747 (32%)	366,737 (17%)
Santa Cruz	1,227 (9%)	8,026 (62%)	3,783 (29%)	13,036 (<1%)
Yuma	20,292 (27%)	38,911 (52%)	14,937 (20%)	74,140 (3%)

Source: US Census Bureau, 2003d

Table 3-14. Household Growth by County

Location	1990	2000	Percent Change	Average Annual Growth Rate in Median Household Income (1990-1995)	Average Annual Growth Rate in Home Sales Price (1990-1995)
Arizona	**1,368,843**	**1,901,327**	**39%**	**3.0%**	**8.3%**
Cochise	34,546	43,893	27%	4.0%	7.3%
Pima	261,792	332,350	27%	4.3%	8.6%
Santa Cruz	8,808	11,809	34%	2.6%	2.6%
Yuma	35,791	53,848	50%	2.9%	4.4%

Source: Arizona Housing Commission, 2000; US Census Bureau, 2003d

3.10.4 Executive Order 12898, Environmental Justice

Executive Order 12898 of February 11, 1994, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires each Federal agency to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its proposed actions on minority populations and low-income communities (59 FR 7629). The racial mix along the border is mainly Caucasian. Santa Cruz County has greater than 50 percent of the population claiming Hispanic origins, and in Yuma County half (50 percent) claim Hispanic origins. Because of the minority populations in these

areas, they are particularly sensitive to environmental justice concerns. Furthermore, the areas along the border, with the exception of Pima County, are significantly below the national average of PCPI. These areas range from 55 to 67 percent of the national average for PCPI. As a result, there is the potential that the activities proposed would be conducted within or in close proximity to low-income populations and neighborhoods in these areas.

3.10.5 Executive Order 13045, Protection of Children

Executive Order 13045 of April 21, 1997, "Protection of Children from Environmental Health Risks and Safety Risks," requires each Federal agency "to identify and assess environmental health risks and safety risks that may disproportionately affect children" and "ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks" (62 FR 19885). This Executive Order was prompted by the recognition that children, still undergoing physiological growth and development, are more sensitive to adverse environmental health and safety risks than adults. The area of highest population density lies within Pima County, which is almost double of the population density of any of the other counties within the ROI. Over half of the population (486,699) resides in the City of Tucson, which is north of the border and away from the majority of the projects outlined in this programmatic document. Several smaller communities also exist along the border including Douglas (5,186), Naco (833), Nogales (6,501), and San Luis (17,816).

3.11 PUBLIC SERVICES AND UTILITIES

3.11.1 Fire and Emergency Medical Service

Fire and emergency medical services within each county are well developed. In each case, fire departments are trained to handle emergencies within their respective jurisdictions. Local community hospitals provide medical services to county residents including medical, surgical, obstetric, psychiatric and long-term care inpatient services. The hospitals are supplemented by clinics, which offer internal medicine, general surgery, pediatrics, sub-specialties, occupational medicine, dental and urgent care services. In certain areas, emergency departments provide ancillary services to support medical services, including but not limited to laboratory, radiology, physical, occupational and speech therapies, and pharmacies.

3.11.2 Police Protection

Each of the counties in the study area maintains local law enforcement departments in their respective cities and towns. For example, in Cochise County, the police department consists of four major divisions, including Patrol, Investigations, Detention, and Support Services. County jails are located in Bisbee, Arizona with substations located in Sierra Vista, Benson, Willcox, and Douglas. In Pima County, the Pima County Sheriff's Department serves the 330,000 people living in unincorporated areas of Pima County. The Yuma Police Department is divided into six major bureaus.

3.11.3 Educational and Social Institutions

Northern Arizona University offers an academic center in Yuma, which provides upper division and graduate education for individuals seeking professional and personal growth, career advancement, or career transition. In Tucson, the University of Arizona has an enrollment of approximately 35,000 students coming from all 50 states and more than 100 foreign countries. In addition, the University of Phoenix, Prescott College, and Northern Arizona University each offer classes to students. On the smaller scale, local community institutions such as Pima Community College and Cochise College serve the residents of Pima, Santa Cruz, and Cochise counties. Pima Community College has five campuses that offer university transfer programs, occupational and developmental education, and special interest courses. Classes, workshops, and seminars are held at more than 145 off-campus locations in Tucson, Davis-Monthan Air Force Base, Green Valley, Nogales, and Sells (Pima Community College 2003). Cochise College has campuses in Douglas and Sierra Vista, centers in Willcox and Benson, and an office at Fort Huachuca. The College is committed to serving citizens throughout Cochise County offering classes at the locations previously mentioned, as well as Bisbee and outlying areas (Cochise College 2003).

3.11.4 Medical Services

Typical medical services are provided under county health programs in Arizona. Examples are the Cochise Health Systems (AHCCCS/ALTCS Managed Care), Environmental Health Housing Assistance, Medical Assistance, Nursing & Community Health Nutrition, and Health Promotion Public Fiduciary. Permanent sites are in Bisbee, Benson, Douglas, Sierra Vista, and Willcox. Many services are mandated by state statute; others are funded by contracts.

In Santa Cruz County, the majority of health care services are located in Nogales, including Carondelet Holy Cross Hospital (CHCH), the only hospital in the county. CHCH provides general medical, critical care, surgical treatment, and outpatient services. CHCH operates two outpatient treatment clinics in the City of Nogales. The Mariposa Community Health Center is a primary care clinic, and is also located in Nogales. Health care provided at this site includes family practice, general practice, internal medicine, obstetrics and gynecology, pediatrics, and dentistry.

3.11.5 Water Supply and Sewer Services

Local municipalities typically supply drinking water supply in Arizona. Local authorities and municipalities also provide sewage services in each county. Most rural areas utilize private water well and septic tank leach field systems.

3.11.6 Stormwater

Stormwater management is largely determined by each county's flood control practices, which are primarily adopted from Federal guidelines. Their function is to protect human life and property. In addition, floodplains typically support important riparian ecosystems and a variety of associated wildlife. These areas also perform an important role in recharging valuable groundwater resources.

3.11.7 Electricity and Natural Gas

Arizona Power Service provides electricity to meet the primary needs of customers throughout Arizona. UniSource Energy Corporation's subsidiary, Tucson Electric Power, provides an additional source of electricity to areas of central and southern Arizona. Southwest Gas provides natural gas utility services to central and southern Arizona.

3.11.8 Solid Waste

The number of facilities available to treat solid waste is dependent upon the size of the respective counties. For example, the Pima County Wastewater Management Department, Solid Waste Division, is a higher volume system that provides and operates public facilities for the safe and sanitary disposal of solid wastes generated within Pima County under authority from the State of Arizona (ARS 49-741).

The Treatment Division operates and maintains the treatment facilities that receive, treat and dispose of over 64 million gallons per day (mgd) of sanitary sewage. Two major facilities handle the sewage from the metropolitan Tucson area, and nine wastewater treatment plants serve remote areas scattered throughout serviced areas of eastern Pima County. In addition, the division includes the Technical Services Section which operates a federally approved pretreatment program and a state of Arizona licensed environmental laboratory for self-monitoring and surveillance sampling.

In Yuma County, residential solid waste transfer sites were authorized in the mid-1980s as a result of concerns for the ability of rural residents to dispose of their household solid wastes. These facilities were constructed in the North Gila Valley, Dome Valley, Wellton, Tacna and Dateland and are maintained by County employees (Public Works/Solid Waste Management). All commercial, industrial or large loads of solid waste not accepted at these facilities are delivered to the Cocopah or Copper Mountain Landfills. In most cases where capacity is insufficient for a particular county, the remaining waste is transported elsewhere for treatment or disposal.

The State of Arizona (ARS 49-742 et. seq.) allows the establishment of solid waste user fees to cover the costs of development, construction, operation, administration, and financing of public solid waste management activities, and broadly controls those activities.

3.11.9 Telephone

Telephone and telecommunications, including local and long-distance voice and data services, are provided to the four counties by SBC Communications, Inc. under the SBC Telecom brand. Several cellular telephone companies also serve the area.

3.12 HAZARDOUS MATERIALS

The USEPA in 1996 listed approximately 15,000 uncontrolled hazardous waste sites in the US The majority of the uncontrolled hazardous waste sites are waste storage/treatment facilities or former industrial manufacturing sites. The chemical contaminants released into the environment (air, soil or groundwater) from uncontrolled waste sites may include heavy metals, organic compounds, solvents and other chemicals. The potential adverse human health impact of hazardous waste sites is a considerable source of concern to the general public as well as government agencies and health professionals.

A total of 851 contaminated sites were identified in the study area: 62 Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Superfund sites (8 - Cochise County, 38 Pima County, 10 - Santa Cruz County and 6 - Yuma), 17 Resource Conservation and Recovery Act (RCRA) violation and corrective action sites, and 772 Leaking Underground Storage Tanks (LUST) sites (USEPA 2004). Counties or areas that are predominantly rural with historically low industrial activity and small populations typically have a low number of reported sites. Therefore, most of the contaminated sites are expected to be located outside the study areaor near the major municipal areas. The trans-boundary movement of hazardous materials/wastes and abandoned or illegal hazardous waste sites is a potential source of pollution occurring in some regions of the border area. Within the area of operation, the transportation, handling, and disposal of hazardous wastes are a cause of public concern.

3.13 NOISE

Noise is defined as unwanted sound. It is emitted from many sources including airplanes, machinery, railroads, power generation plants, construction equipment, and highway vehicles. The magnitude of noise is described by its sound pressure. Since the range of a pressure varies greatly, a logarithmic scale is used to relate sound pressures to some common reference level, the decibel (dB). Sound pressures described in decibels are called sound pressure levels.

The human ear can hear frequencies from about 20 hertz (Hz) to about 20,000 Hz. It is most sensitive to sounds in the 1,000 to 4,000 Hz ranges. When measuring community response to noise, it is common to adjust the frequency content of the measured sound to respond to the frequency sensitivity of the human ear. The adjustment is called A-weighting (American National Standards Institute (ANSI) 1993). Sound levels measured using an A-weighted decibel scale are expressed as dBA. Throughout this analysis, all noise levels are expressed in dBA. Several examples of noise pressure levels in dBA are listed in Table 3-15.

Noise is usually described in Leq (time-averaged equivalent noise level) or DNL (day-night average noise level). Leq is the equivalent sound level of a steady sound, which has the same A-weighted sound energy as that contained in a time-varying sound, over a specific time period.

Table 3-15. A-Weighted (dBA) Sound Levels of Typical Noise Environments

dBA	Overall Level	Noise Environment
120	Uncomfortably Loud (32 times as loud as 70 dBA)	Military jet takeoff at 50 feet
100	Very loud (8 times as loud as 70 dBA)	Jet flyover at 1,000 feet
80	Loud (2 times as loud as 70 dBA)	Propeller plane flyover at 1,000 feet Diesel truck 40 mph at 50 feet
70	Moderately loud	Freeway at 50 feet from pavement edge Vacuum cleaner (indoor)
60	Relatively quiet (1/2 as loud as 70 dBA)	Air condition unit at 10 feet Dishwasher at 10 feet (in door)
50	Quiet (1/4 as loud as 70 dBA)	Large transformers Small private office (in door)
40	Very quiet (1/8 as loud as 70 dBA)	Bird calls Lowest limit of urban ambient sound
10	Extremely quiet (1/64 as loud as 70 dBA)	Just audible
0	Threshold of hearing	

Source: Federal Agency Review of Selected Airport Noise Analysis Issues 1992

DNL is defined as a 24-hour averaged noise level with a 10-dB nighttime (between 10 P.M. and 7 A.M.) penalty. It is the community noise metric recommended by the USEPA and has been adopted by most Federal agencies. A DNL of 65 dB is the level most commonly used for noise planning purposes. Areas exposed to DNL above 65 dB are generally not considered compatible for residential use.

Noise is also influenced by many types of variables, including the type of equipment generating the noise, vegetation, topography, climate, season of the year, time of the day, and proximity to the noise sources. Noise attenuation is usually estimated at 6 dBA each time the distance is doubled (*e.g.*, a 100 dBA noise level at 100 feet from the source would be 94 dBA at 200 feet).

3.14 AESTHETICS

Aesthetics are essentially based on an individual's judgment as to whether or not an object is pleasing and/or would influence quality of life. The major visual appeal to southern Arizona lies in its vast areas of naturally occurring landscape. It is known for its tranquil dark skies and scenic mountain ranges. Several unique and pristine areas, as well as designated Wilderness Areas exist within the study areaand contribute to the overall beauty of the desert region. Areas visited for their natural setting and aesthetic values include, but are not limited to, the CPNWR,

OPCNM, Coronado National Forest, Coronado National Memorial, as well as the various designated wilderness areas in the affected area.

SECTION 4.0
ENVIRONMENTAL CONSEQUENCES

4.0 ENVIRONMENTAL CONSEQUENCES

For the purposes of this impact analysis, several assumptions were made by the PEIS Interdisciplinary Team regarding the area of potential impact for each type operation/activity. Technology-based systems and operational dependent infrastructure include RVS systems, tactical checkpoints, new stations, lighting, and rescue beacons. RVS system towers impact 0.2 acre in contrast to monopole RVS systems that impact 0.05 acre. Because the exact types of towers to potentially be erected are not known at this time, the maximum impact was assumed to account for all potential impacts resulting from RVS systems. Therefore, the installation of RVS sites was estimated to affect 0.2 acre per site. The construction and operation of a tactical checkpoint facility and temporary camp detail area were estimated to affect approximately 0.5 acre each. New station construction or expansion was estimated to affect approximately 20 acres. Illumination effects for portable lights were assumed to occur along the total length of project corridors in each Sector. However, most portable lights are located along roads and other disturbed areas and not all lights would be operated at the same time; therefore, it is likely that the actual impact from illumination would be less than that shown in this revised draft PEIS.

Furthermore, at the programmatic level, the exact location of portable lights and the schedule for their operation are not known. Given these assumptions, the potential affected area from existing and approved operations, technologies, and infrastructure within the Tucson and Yuma sectors are quantified in Tables 4-1 and 4-2, respectively. Approved infrastructure, technology-based systems, and infrastructure dependent operations can be quantified; however, expanded operations such as off-road pursuits and air patrols are not easily quantifiable because it is unknown when and where agents may need to pursue an IE. BP agents limit off-road patrols to situations where IEs or their tracks are observed or in search and rescue operations. The expansion of these types of operational activities would have an adverse impact on the natural and human environment. In this PEIS it will be assumed that impacts would increase in equal proportion to manpower increase.

The following discussions describe and, where possible, quantify the potential effects of each viable alternative on the resources within or near the project area. These discussions are presented in the same sequential order as they appeared in Section 3 for each alternative carried forward for analysis. Transportation would not affect or be affected by the proposed alternatives and is excluded from the following discussion.

Table 4-1. Approved and Ongoing Operation/Activities and Infrastructure Within Tucson Sector

PROJECT DESCRIPTION*	AREA IMPACTED (Acres)
INFRASTRUCTURE	
Approved	
Road/ construction and or upgrades (36 feet wide X 48 miles long)	209
Primary fence barriers (pedestrian fencing and/or vehicle barriers with a 10 feet maintenance road) (12 feet wide X 41 miles long)	60
All-weather maintenance road (10 feet wide X 7 miles long)	8
Secondary fencing enclosing the border area (Calculation excludes area of roadways that exist between fences)(60 feet wide X 11 miles long) (270 feet wide X 7 miles long)	222
New station facility construction (1 site X 20 acres)	20
International ditch upgrade (15 feet wide X 1.1 miles long)	2
Stadium light area of illumination (300 feet wide x 7 miles long) & (60 feet wide x 11 miles long)	334
Drag roads (10 feet wide X 13 miles long)	44
SUBTOTAL[1]	**899**
Ongoing	
Pedestrian fencing (landing mat, bollard, vehicle barrier, and decorative) (Calculation based on a 2 feet permanent impact estimate) (2 feet wide X 48.1 miles long)	12
Stadium light area of illumination (300 feet wide x10 miles long)	363
SUBTOTAL[4]	**375**
TOTAL INFRASTRUCTURE[A]	**1,274**
TECHNOLOGY-BASED SYSTEMS	
Approved	
RVS sites (35 sites X 0.05 ac)	2
Rescue beacons (20 sites X 9 square feet)	0.004
SUBTOTAL[2]	**2**
Ongoing	
Repeater sites (22 sites X 400 feet^2)	0.2
Ongoing operation of ground sensors (1,495 sites X 1 feet^2)	0.03
RVS site (32 sites X 0.05 ac)	1.6
SUBTOTAL[5]	**2**
TOTAL TECHNOLOGY-BASED SYSTEMS[B]	**4**
OPERATIONS	
Approved	
Expansion of vehicles, personnel, off road and air patrols**	N/A
Portable lights area of illumination (200 ft wide x 4 miles long)	96
SUBTOTAL[3]	**96**

Table 4-1 continued

PROJECT DESCRIPTION[1]	AREA IMPACTED (Acres)[2]
OPERATIONS (continued)	
Ongoing	
Portable lights area of illumination (200 feet wide x 60 miles long)	1,454
Dragging operations (10 feet wide X 253 miles long)	307
Checkpoints (7 sites X 1 acre)	7
Operations Desert Grip, Skywatch & ABCI (temporary camp sites) (7 sites X 0.5 acres)	4
Patrol approximately 1,678 miles of road (20 feet wide X 3,168 miles long)	7,680
SUBTOTAL[6]	**9,452**
TOTAL OPERATIONS[C]	**9,548**
TOTAL TUCSON SECTOR APPROVED (1+2+3)	**997**
TOTAL TUCSON SECTOR ONGOING (4+5+6)	**9,829**
TOTAL TUCSON SECTOR (A+B+C)	**10,826**

[*] Project Descriptions were derived from approved and ongoing CBP operations/activities and infrastructure provided by the Tucson Sector. Values were derived from previous environmental analysis and geographic information systems data of existing BP infrastructure as of September 1, 2003. All estimates (*e.g.*, widths and length, number of sites and area of impact) are presented according to scale (widths are generally given in feet and lengths in miles) as most project features are linear in nature.

[**] Although these actions would impact the natural and human environment they are largely unquantifiable at this time.

Table 4-2. Approved and Ongoing Operation/Activities and Infrastructure Within the Yuma Sector

PROJECT DESCRIPTION*	AREA IMPACTED (Acres)
INFRASTRUCTURE	
Approved	
New station facility construction (1 site x 20 acres)	20
SUBTOTAL[1]	**20**
Ongoing	
Pedestrian fencing (landing mat, bollard, vehicle barrier, and decorative) (Calculation based on a 2 feet permanent impact estimate) (2 feet wide X 6 miles long)	1.5
SUBTOTAL[4]	**1.5**
TOTAL INFRASTRUCTURE[A]	**21.5**
TECHNOLOGY-BASED SYSTEMS	
Approved	
No projects identified at this time	N/A
SUBTOTAL[2]	N/A
Ongoing	
Repeater sites (3 sites X 400 square feet)	0.03
Ongoing operation of ground sensors (420 sites X 1 square feet)	0.009
Rescue beacons (11 sites X 9 square feet)	0.002
RVS site (15 sites X 0.05 ac)	.75
SUBTOTAL[5]	**.79**
TOTAL TECHNOLOGY-BASED SYSTEMS[B]	**.79**
OTHER OPERATIONS	
Approved	
Expansion of vehicles, personnel, off-road and air patrols**	N/A
SUBTOTAL[3]	N/A
Ongoing	
Dragging operations (10 feet wide X 262 miles long)	318
Checkpoints (3 sites X 1 acre)	3
Operations Desert Grip, Skywatch & ABCI (temporary camp sites) (1 sites X 2.75 acres and 1 X 0.5 acre)	3
Patrol approximately 690 miles of roads (20 feet wide X 690 miles long)	1673
Portable lights area of illumination (200 feet wide X 3 miles)	73
SUBTOTAL[6]	**2,070**
TOTAL OPERATIONS[C]	**2,070**
TOTAL YUMA SECTOR APPROVED (1+2+3)	**20**
TOTAL YUMA SECTOR ONGOING (4+5+6)	**2,072**
TOTAL YUMA SECTOR (A+B+C)	**2,092**

* Project Descriptions were derived from approved and ongoing CBP operations/activities and infrastructure provided by the Tucson and Yuma Sectors. Values were derived from previous environmental analysis and geographic information systems data of existing BP infrastructure as of October 1, 2003. All estimates (*e.g.*, widths and length, number of sites and area of impact) are presented according to scale (widths are generally given in feet and lengths in miles), as most project features are linear in nature.

** Although these actions would impact the natural and human environment they are largely unquantifiable at this time.

4.1 LAND USE

4.1.1 No Action Alternative

Implementation of the No Action Alternative would result in negative impacts to land use within the Tucson and Yuma Sectors, due to the use of four-wheel drive vehicles, horses, ATVs and motorcycles by IEs or BP agents in designated Wilderness Areas. IEs breach the border in vehicles or on foot, requiring BP agents to use four-wheel drive vehicles and ATVs to apprehend them. Under this alternative indirect adverse impacts from illegal traffic would continue and likely increase. The creation and use of Illegal roads and trails, abandoned vehicles, and litter left behind by IEs would continue to degrade the wilderness characteristic of designated Wilderness Areas and destroy valuable wildlife and protected species habitat on both public and private lands (see Figures 1-5 and 1-6).

Some road construction projects in the Naco and Douglas AOs are currently underway and would not be completed under this alternative. Road maintenance, dragging, and road patrols would continue at the current level existing roads; thus, land use would not change.

The “Roosevelt Reservation” is a 60-foot wide corridor on Federal lands along the US-Mexico border. This corridor is regulated by the Federal government as specified under a Presidential Proclamation on May 27, 1907, and has historically been used for patrols, border demarcation, and barrier systems. The BP would continue enforcement activities within the Roosevelt Reservation.

4.1.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

Land use within the Tucson and Yuma Sectors would be affected by implementation of Alternative 1 (Preferred Alternative). Construction of a new BP Station in the Willcox AO would not affect land use since the site exists on land already classified as urban. Purchase of property for a station facility in the Nogales AO would not result in an impact to the area’s land use since the action would only involve the purchase of an existing building. Similarly, tactical checkpoints would not result in a change in land use, since these areas would be placed along county, state or Federal highways within the road ROW.

Actions that would affect land use to some extent are the installation of RVS sites and rescue beacons in the Tucson and Yuma Sectors. These approved sites would take place on private and public lands used for rangeland, grazing, and recreational activities. Installation of RVS sites would require surface disturbance of approximately 0.2 acre at each location. With the exception of the new access road construction, other areas disturbed by RVS construction activities would typically be insignificant and would return to their original state over time. The approved installation and operation (illumination) of permanent or portable lights would not have impacts to grazing or rangeland; therefore, under Alternative 1, the overall land use adjacent to each lighting location would not significantly change. Portable and permanent lighting along the border in the study area would illuminate an area 150 feet north of the US-Mexico border with the lights oriented in a southerly direction.

The largest impact to land use would occur through the completion of approved infrastructure projects such as roadway construction or upgrades, primary and secondary fences, vehicle barriers, and maintenance roads. These actions were initially addressed in the 2000 INS Final Environmental Assessment (EA) for Infrastructure within US Border Patrol Naco-Douglas Corridor, Cochise County, Arizona (INS 2000a) and then readdressed in the 2003 Supplemental EA for Infrastructure within BP Naco-Douglas Corridor, Cochise County, Arizona (DHS 2003d). The greatest contributing factor is the construction of fencing and roadways in the Naco and Douglas Stations AOs that would essentially convert rangeland roadways and associated infrastructure. The remaining areas proposed for fence or vehicle barrier installation and roadway construction would impact land use to a much lesser degree. These areas would generally undergo construction in the same alignments as previous construction; therefore, land use within the region would not change significantly. Road improvements and/or fence construction implemented within or near National Wildlife Refuges, National Parks, SPNRCA or the Coronado National Memorial would require coordination and approval from USFWS, NPS, BLM and USFS respectively. Land use would be impacted within the footprint of fence or road construction. Upon construction and/or improvements to roadways and fence projects, routine maintenance would be conducted, yet would not result in any additional changes in land use since all maintenance activities would occur on existing road surfaces.

Current and expanded operations (*e.g.*, Operation Skywatch, Operation Desert Grip and ABCI) would impact land use within the study area. Some recreational opportunities could be affected by increased operations. Specific roads and/or areas may be closed to recreationists during

maintenance activities. The type (adverse or beneficial) and magnitude of these impacts would depend upon the type and duration of the operation, season, time of day, and personal viewpoint of the recreationist. Increased off-road access and use of administrative trails for tracking IEs could have a significant adverse affect on Wilderness Areas. The impacts from expanding operational activities such as off-road patrols and air patrols cannot be quantified because the extent of these operations is not known at this time. Under the ABCI plan the number of agents assigned to the Tucson and Yuma Sectors increased by approximately 10 percent; therefore, it could be assumed that patrols and consequent impacts associated with patrols could increase by 10 percent.

As mentioned previously, illegal traffic has significantly affected the land use on public and private lands. Furthermore, illegal vehicle traffic has created roads through Wilderness Areas. In some areas this damage is so severe that wilderness value has been degraded for these areas (Tibbitts 2004). Alternative 1 would have indirect beneficial impacts to land use from reducing such illegal activities on public and private lands. Increased operations, technology-based systems, and completion of approved infrastructure would, in the long-term, reduce the use and prevent the creation of illegal roads and trails, reduce litter deposited by IEs, reduce vegetation and habitat damage, and reduce erosion resulting from illegal vehicle and foot traffic.

4.1.3 Alternative 2. Expand Technology-Based Systems and Approved Infrastructure

Land use within the Tucson and Yuma Sectors would not be significantly affected by the implementation of this alternative. Since installations of RVS sites and rescue beacons are the only operational activities that affect land use, the overall land use of the study area would not significantly change. Land use impacts under this alternative would be substantially less compared to Alternative 1. Off-road patrols, air patrols, and road patrols would not be increased under this alternative. However, indirect beneficial impacts would be less compared to those described under Alternative 1. IEs would continue to attempt to cross the border and, ultimately, be successful in the absence of expanded operations, even though the expansion of technology-based systems and completion of approved infrastructure would allow the BP to detect IEs in proximity to border. Increased operations are needed to apprehend IEs, and without expanded enforcement actions, indirect adverse impacts from illegal traffic would continue or likely increase.

4.1.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

Alternative 3 would not allow the completion and maintenance of approved infrastructure; therefore, land use within the Tucson and Yuma Sectors would not be affected by these activities. However, it must be noted that operational dependent infrastructure such as a BP station would be constructed or acquired. Installation of RVS sites would require surface disturbance of up to 0.2 acre at each location depending on the design. With the exception of the physical pole locations, other areas disturbed by construction activities would return to their original state over time. Installation of RVS would change the land use in the immediate vicinity of the RVS pole or tower.

Impacts from the expansion of patrol agents under the ABCI, increased off-road access, increased road patrols, and increased air patrols would be the same as those described for Alternative 1. Indirect beneficial impacts would be realized to a lesser degree compared to Alternative 1.

4.2 SOILS

4.2.1 No Action Alternative

Implementation of the No Action Alternative would eliminate future direct disturbances to soils from approved infrastructure. However, existing erosion problems would continue without BP road improvement projects. Agents would be forced to use unimproved roads in order to detect and apprehend IEs. The erosion rates would likely increase without abatement measures.

Indirect effects to soils would also occur as IEs would traverse these areas to avoid areas that currently contain some barrier system components. Since operations, technology, and infrastructure would stay the same, more IEs would be able to successfully enter the US. Increased illegal foot and vehicle traffic would continue to create illegal trails and road, thus potentially increasing erosion. Abandoned vehicles and other waste discarded by IEs would potentially leach hazardous substances (*e.g.* oil, antifreeze, gasoline, etc.) into the soil.

4.2.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

Implementation of Alternative 1 would disturb approximately 587 additional acres of soils, exclusive of permanent and portable lights. Potential impacts from illumination are not

considered because illumination would not disturb soils. However, additional soil disturbances from unquantifiable operational activities (*i.e.*, increased off-road patrols) would be expected. Soil disturbance from the construction of approved infrastructure would occur almost exclusively within the Tucson Sector. Previously disturbed routes and or locations would continue to be utilized to the maximum extent practicable to reduce the potential for soil impacts. Areas with highly erodible soils were given special consideration when designing proposed facilities or structures to ensure incorporation of various compaction techniques, aggregate materials, wetting compounds, and revegetation to minimize the potential of soil erosion. Borrow materials, if required, would be obtained from established borrow areas or from on-site sources, as allowed by the appropriate regulatory agencies. Borrow material is earthen material (such as soil, sand, or rock) that is suitable for construction requirements. Potential mitigation, if necessary, was included as part of the project specific NEPA analysis.

The major engineering construction activities (*e.g.*, roads, fences, BP stations, etc.) would produce the greatest impacts to soils. Construction of BP stations would require that the site be cleared and grubbed with portions of the site paved. Thus, these soils would be essentially removed from biological production. Approximately 587 acres of vegetation would be cleared. This assumes that areas enclosed within secondary fencing, if constructed, would be mechanically cleared of vegetation to improve the line of sight for patrol agents. Vegetation clearing is mentioned with soil impacts because mechanical clearing of vegetation would result in potential impacts to soils. If other less intrusive methods (*e.g.* hand clearing) are used, impacts to soils would be minimized. RVS sites, rescue beacons, and ditch upgrading would also require some soil disturbance.

Soils along the border are typically very sandy and highly erodible. Any construction activity conducted by the BP must evaluate the erosion potential of the soils in the study area and incorporate erosion control designs into the construction plan. A Stormwater Pollution Prevention Plan (SWPPP) and Notice of Intent (NOI) under the CWA's National Pollutant Discharge Elimination System (NPDES) will be required for all construction sites greater than one acre (33 U.S.C. §1342).

Prime and unique farmlands, as defined by the US Department of Agriculture, Natural Resources Conservation Service (NRCS), are rare along the border. Future projects would

continue to make all practical attempts to avoid alterations to prime farmlands. Subsequent tiered NEPA documents would address prime farmlands on a site-specific basis.

Road maintenance activities would result in reduction of soil erosion in many areas. Roads that are considered impassable due to severe erosion are typically recommended for upgrades. Repair/upgrade activities would include specific design measures to control erosion. Additional or modified compaction techniques and erosion control measures, such as water bars, mats, gabions, straw bales, re-seeding, and others would be implemented to alleviate these situations. Some increased erosion would be expected as a result of existing and expanded operations such as Operation Desert Grip and the ABCI. These activities would result in increased off-road and road patrols in the region. Negligible impacts to soils would result from Operation Skywatch. While the majority of activities would occur above ground, in the event of SAR missions aircraft would require infrequent landings in remote areas to retrieve distressed persons. If these landings are required, they could result in minor soil disturbances due to propeller or rotor wash. Off-road vehicular traffic is expected to increase with the expansion of operations and the ABCI, thus resulting in additional ground disturbance. Vehicular traffic is normally restricted to existing roads and trails, to the extent practicable, unless agents are in pursuit of known IEs or conducting SAR missions. Some disturbances of existing road surfaces and subsequent soil disturbance would be expected from the preparation of drag roads. Potential disturbances to soils would be expected to increase by approximately 10 percent over 6,508 acres as a result of expanding operations.

Alternative 1 would have indirect beneficial impacts to soils in the study area as a result of reducing illegal vehicle and foot traffic. Reducing illegal traffic would reduce the use and creation of illegal roads and trails and damage to vegetation, thus reducing potential soil erosion. Reducing illegal vehicle traffic would reduce the number of abandoned vehicles in the project area, thus reducing the potential for soil contamination from hazardous materials (*e.g.*, oil, antifreeze, gasoline, etc.).

4.2.3 Alternative 2. Expand Technology-Based Systems and Approved Infrastructure

Alternative 2 would also disturb approximately 587 acres of soil (exclusive of illumination area) due to the completion of approved infrastructure construction within the Tucson and Yuma Sectors as indicated previously in Tables 4-1 and 4-2. Direct impacts to soils would be less under Alternative 2, because operational activities would not be expanded. Although the

quantifiable impact is the same as Alternative 1, less soils would be potentially impacted as a result of not expanding off-road and road patrols. Indirect beneficial impacts would be realized to a lesser degree compared to Alternative 1. Indirect effects to soils would continue, since IEs would continue to attempt to evade detection and apprehension. Without the additional operational activities (*e.g.*, station expansion, Operation Desert Grip, Operation Skywatch, and road dragging) that would facilitate increased apprehensions, IEs would continue to be successful at entering the US and deterrence would be less compared to Alternative 1. More illegal entry attempts would result in increases of off-road vehicle and foot traffic by IEs and BP agents.

4.2.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

The expansions of operations and technology-based infrastructure would increase soil disturbance in the study area. Approximately 2 acres (exclusive of portable lights) would be disturbed by the expansion of technology-based systems; however, based on the 10 percent increase in agents and off-road and road patrols, soil disturbance would potentially increase above 10,011 acres by approximately 10 percent. Disturbances would be similar to those described for Alternative 1 with the exception of disturbances resulting from completing approved infrastructure. Without the completion of approved infrastructure, IEs would not be deterred from entering the US. Thus, indirect beneficial impacts would be less than those expected under Alternative 1.

4.3 PRIME FARMLANDS

4.3.1 No Action Alternative

There are two possible sources of impacts to Prime Farmlands under the No Action Alternative. Without expanded operations, technology-based systems, and approved infrastructure, IEs would continue to disturb soils and any crops found on prime farmlands. Further, apprehension efficiency would not be improved and could result in otherwise avoidable impacts to prime farmlands. There would be no beneficial effects of the No Action Alternative to Prime Farmlands.

4.3.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

The expansion of operations would increase the potential for the occurrence of BP off-road activities, and associated impacts, on Prime Farmlands. Technology-based systems and

approved infrastructure would not have direct impacts to Prime Farmlands. Each of the measure in Alternative 1 would have short term indirect impacts as BP activity increases in the area of Prime Farmlands and long-term benefits as detection and apprehension become more efficient, deterrence becomes greater, and IE activities decrease in the area of Prime Farmlands.

4.3.3 Alternative 2. Expand Technology-Based Systems, and Approved Infrastructure

Under Alternative 2, there would be no impacts to prime farmlands as a result of expanded operations. The expansion of technology-based systems and approved infrastructure would also have no impact to prime farmlands. The indirect beneficial impacts of Alternative 2 would be less than those experienced under Alternative 1.

4.3.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

Under Alternative 3 the expansion of existing operations would affect Prime Farmlands in a manner similar to Alternative 1. However, without the synergistic effect of implementing all three measures, the indirect, beneficial impacts of Alternative 3 would be less than those experienced under Alternative 1.

4.4 BIOLOGICAL RESOURCES

4.4.1 Vegetation Communities

4.4.1.1 No Action Alternative

Implementation of the No Action Alternative would eliminate direct adverse effects to vegetation communities along the border since none of the approved construction activities or increases in operations would occur. However, indirect adverse effects (*e.g.* wildfires and erosion) would continue and potential increase as a result of illegal vehicle and foot traffic and subsequent BP enforcement actions. Illegal roads and trails created by IEs damage and destroy vegetation (see Figures 1-5 and 1-6). Warming fires started by IEs is also responsible for destroying vegetation on public and private lands. The TON fire department has responded to approximately 100 fires set by IEs in FY 2004 to date (Steere 2004). In addition to direct physical damage, illegal traffic is a major distributor of exotic and noxious weed seeds along the border. Seeds from exotic and noxious weed are transported into the US on vehicles and the clothing of IEs. Exotic and noxious weeds compete with and often eliminate native vegetation.

4.4.1.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

Construction of facilities and roads, vegetation clearing, and other ongoing activities would impact vegetation throughout the project area. Site-specific surveys of vegetation communities by qualified biologists were conducted to determine potential impacts to vegetation communities as part of the NEPA process for future projects such as special operations or RVS poles. Subsequent tiered NEPA documents would need to address potential impacts to ensure that sensitive and rare vegetation communities are not affected.

Alternative 1 would result in the disturbance of approximately 1,017 acres (approximately 430 acres would be illumination impacts) of vegetation as a result of infrastructure projects such as roads, fences, and other projects identified previously in Tables 4-1 and 4-2. Where practicable, the BP would attempt to avoid impacts to native vegetation by utilizing existing or previously disturbed areas. Disturbed lands include those that have been graded, paved, plowed, or replanted with non-native vegetation. To minimize adverse impacts to vegetation, temporarily disturbed areas would be revegetated with native plant species seeds or native plants. Enhanced patrol efforts allowed by new roads and improvements to existing roads would reduce indirect impacts associated with illegal traffic. The construction of fences, technology-based infrastructure, and other new infrastructure would enhance apprehensions and deter IEs from crossing the border, thus creating indirect beneficial impacts.

As seen above, direct impacts would occur within the construction footprint of specific projects. The loss of vegetation would be inevitable within construction footprints. The expansion of off-road activities and the use of patrol roads would directly impact vegetation. Off-road activities could damage or destroy vegetation. Expanded off-road activities, patrols on un-improved or semi-improved roads, and dragging opertions would potentially increase fugitive dust emissions in the project area. Fugitive dust reduces photosynthesis and evapotranspiration of adjacent vegetation. The expansion of these operational activities is expected to increase potential impacts to vegetation by 10 percent above 6,508 acres. Weed seed free horse feed would be used for BP horses to minimize the potential to spread exotic and noxious weeds.

Lighting systems used by the BP generally use bulbs ranging from 400 to 1,000 watts that illuminate an area within 200 feet from the light source. The flood of light is generally in one direction, since shields are placed over the lamps. The shields reduce or eliminate the effects

of backlighting. Lights are generally operated continuously every night from dusk until dawn. Existing evidence shows that lights emitting energy between 300 and 800 nanometers are effective in influencing the photosynthesis and photo responses of plants (DHS 2003d). However, the amount of energy produced by the bulbs under this alternative is not anticipated to be enough to produce measurable effects on plants outside of the illuminated area. Furthermore, recent tests in the Naco Station on reduced stray lighting (backlighting) due to the use of shields have provided evidence that the shields are successful at containing and focusing the illumination (DHS 2003d).

Implementation of Alternative 1 would allow the BP to detect and apprehend IEs in close proximity to the border. Early detection and apprehension of IEs in proximity to the border would have an indirect beneficial impact on vegetation. Habitat and vegetation damage from illegal traffic and the consequent BP enforcement actions would potentially be reduced. In conjunction with beneficial indirect impacts, other indirect adverse effects could potentially occur such as the loss of vegetation in previously undisturbed areas as illegal traffic shifts to avoid fences or heavily patrolled areas. The extent of these effects is not quantifiable at this time since the future traffic patterns of IEs are not predictable.

4.4.1.3 Alternative 2. Expand Technology-Based Systems and Approved Infrastructure

By implementing Alternative 2, approximately 921 acres (including 334 acres of illumination) of vegetation would be directly impacted. Although the quantifiable increase is the same for alternatives 1 and 2, the direct impacts associated with this alternative would be less than those expected under Alternative 1. Potential impacts to vegetation from expanded off-road patrols, dragging operations, and patrols on semi- and unimproved roads expected under Alternative 1 would not occur under this alternative. Construction of facilities and roads, vegetation clearing, and other ongoing activities would impact vegetation throughout the project area. Approximately 587 acres of vegetation (exclusive of stadium lights) would be permanently affected by the construction of approved infrastructure. The construction of RVS systems and stadium style lights would impact vegetation in the immediate vicinity of the tower or poles. Potential effects to vegetation from the establishment of RVS systems and stadium style lights would be negligible.

Alternative 2 calls for the use of technology-based systems as the primary method of detecting breaches of the border. Agents would still have to react and pursue IEs as they cross the

border, sometimes well after they have crossed, which in turn would result in more off-road patrols and subsequent impacts to vegetation. Fugitive dust accumulating on vegetation adjacent to existing dirt roads would continue as a result of illegal traffic and subsequent BP actions. Indirect adverse impacts to vegetation from illegal traffic would continue but to a lesser degree than the No Action Alternative.

4.4.1.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

Alternative 3 would have the fewest direct impacts to vegetation since none of the approved physical infrastructure would be constructed. Technology-based systems and operation of portable lights would impact approximately 98 acres of vegetation communities.

Increased operations, such as ground patrols and off-road activities, and some of the activities associated with operational support missions, would have adverse effects on vegetation. Recovery times for vegetation communities depend on the extent of damage incurred. Without upgrades to existing infrastructure, such as road improvements, indirect impacts to vegetation would increase. Illegal traffic and subsequent off-road patrol traffic would cause vegetation loss along makeshift roads and trails through soil compaction and erosion. In the absence of improved roads and fences, the response time for BP agents would increase, thus forcing BP agents to pursue IEs further from the US-Mexico border. Without the completion of approved infrastructure, impacts to vegetation could potentially be greater than Alternative 1 as a result of off-road enforcement activities.

4.4.2 Fish and Wildlife Resources

4.4.2.1 No Action Alternative

As presented in Tables 4-1 and 4-2, approximately 11,901 acres of potential wildlife habitat have been impacted by BP operations, existing infrastructure and technology-based systems. Approximately 1,890 acres of the 11,901 acres is the area affected by illumination, which does not cause direct physical impacts to vegetation and wildlife populations. Although light does not cause physical harm or danger, it can have behavioral impacts. Site-specific impacts have been addressed and approved in prior NEPA documents (INS 2002g, INS 2000a, USACE 2001b) and are incorporated herein by reference.

Implementation of the No Action Alternative would not have additional direct effects on wildlife populations; approved infrastructure would not be completed, and the expansion of operations

and existing and technology-based systems would not occur. Indirect effects would occur, however, due to changes in habitat quality and quantity immediately north of the international border. Concomitant effects to wildlife populations would be in line with the beneficial or adverse impacts to their habitats. If there were a future reduction in BP patrol and enforcement activities, then the quality and quantity of habitats in the ROI could increase, thereby enhancing wildlife population numbers and diversity. Contrarily, if the number of IEs likely rises and the consequent apprehension efforts increase within the Sonoran desertscrub habitats (which is likely under the No Action Alternative), the wildlife populations supported by the habitats would be adversely affected. In addition, without the expansion of operations and technology-based systems and supporting infrastructure, illegal traffic and BP enforcement efforts would occur further north of the US-Mexico border. Thus, this would increase the area of potential impacts to wildlife habitat from trampling by IEs.

4.4.2.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

As presented in Tables 4-1 and 4-2, approximately 1,017 acres of wildlife habitat would be directly impacted due to the completion of approved infrastructure and the expansion of operations and technology-based systems. Wildlife movement and dispersal corridors in the study area would potentially be impacted by the completion of existing and approved infrastructure. The greatest movement of small animals generally occurs when disturbances such as road grading, clearing and grubbing, or fence construction occurs. Mobile animals escape to areas of similar habitat, while other slow or sedentary animals such as reptiles, amphibians, insects, and small mammals could potentially be lost. This displacement and/or reduction in the number of animals would not significantly impact animal communities due to the presence of similar habitat adjacent to the project area. Larger terrestrial wildlife movements in the construction and maintenance areas would not be significantly affected due to the short duration of these activities. Due to the high temperatures in a majority of the study area, construction activities often begin near daybreak. However, some nighttime or pre-dawn construction would be required to avoid extreme high temperatures during the summer months. These activities could potentially cause temporary impacts to wildlife.

Roads and fences result in other indirect impacts. By design, improved roads would increase the speed at which vehicles travel. Higher vehicular speeds decrease the response time for drivers to avoid wildlife and wildlife to avoid the vehicles, thus, potentially increasing the number

of accidental wildlife deaths. Fences serve as a barrier to some wildlife species; the magnitude of this effect depends upon the fence design and location. Fences planned in more remote locations away from the POE might, depending on the type, pose a physical barrier to wildlife and could result in potential habitat fragmentation. Vehicle barriers, as the name implies, are constructed to prevent vehicular traffic and do not typically impede wildlife movement, nor do they remove/alter significant amounts of wildlife habitat.

In contrast to the direct adverse impacts associated with this alternative, roads and fences have afforded protection to some wildlife species and other sensitive resources. Fences do significantly reduce illegal entries, which in turn reduce BP apprehension efforts, thus, indirectly benefiting wildlife habitats north of the border by protecting them and their habitat from increased vehicle and foot traffic.

Impacts to wildlife resulting from the operation of the high intensity lighting at night could potentially occur. Approximately 430 additional acres could be illuminated under this alternative. The increase in lights along the border could also produce some long-term behavioral effects, although the magnitude of these effects in some areas is not presently known. Some species, such as insectivorous bats, may benefit from the concentration of insects that would be attracted to the lights. The adverse and/or beneficial effects of lighting on reptiles and amphibians are currently unknown; however, continual exposure to light has been proven to slightly alter circadian rhythms in mammals and birds. Studies have demonstrated that under constant light, the time an animal is active, compared with the time it is at rest, increases in diurnal animals but decreases in nocturnal animals (Carpenter and Grossberg 1984). Utica College (New York) frog researchers have found that sudden exposure to artificial light can cause nocturnal frogs to suspend normal feeding and reproductive behavior and sit motionless, long after the light has been turned off. Studies of moths indicate they typically go into erratic dives when they sense that they have been detected by foraging bats. By exposing moths to simulated bat echolocation sounds, the University of Göteborg found that artificial light reduces moths' use of this defensive behavior, thereby interfering with their escape (Harder 2002). The alteration of circadian rhythms by high intensity lighting is minimal, accounting for a maximum of two to three hours of increase or decrease in activity per day (Luce 1977). It has also been shown that within several weeks under constant lighting, mammals and birds would quickly stabilize and reset their circadian rhythms back to their original schedules (Carpenter and Grossberg 1984). Lighting could potentially increase the prey potential of certain species.

The long-term effects of an increased photoperiod on mobile wildlife species are expected to be insignificant. Given the vast open space within the study area, animals can easily relocate to adjacent areas of darkness and most animals would be expected to acclimate to the permanent lighting.

The expansion of operational activities, such as increased off-road access, increased air patrols, and increased road patrols would have a potential adverse impact on wildlife species. Increased off-road access and air patrols could disturb wildlife species and their habitat as well as increase the potential for a BP agent to collide with wildlife species. IE traffic and BP off-road access and pursuits can adversely impact wildlife habitat and individuals by soil compaction, crushing/trampling vegetation, and degredation of habitat. Off-road traffic (including foot and vehicular) causes direct impacts to the soil through compaction. Compaction causes poor vegetation growth and erosion. Vegetation that serves as food, cover, and nesting habitat is trampled, crushed, uprooted, or otherwise disturbed during off-road activities. The combination of soil compaction and vegetation disturbance results in the degredation of wildlife habitat.

Table 4-3 presents estimates of the number of wildlife specimens that could be lost from direct impacts within the study area as a result of this alternative. It should be noted that these losses could occur throughout the entire study area and that these individual numbers represent numerous different species.

4.4.2.3 Alternative 2. Expand Technology-Based Systems and Approved Infrastructure

As presented in Tables 4-1 and 4-2, approximately 587 acres of wildlife habitat would be lost due to expansion of technology-based systems and completion of approved infrastructure. Under Alternative 2, approved infrastructure projects would occur causing directs impacts similar to, but less than Alternative 1. Potential impacts to wildlife as a part of expanding off-road operations, air patrols, and road patrols associated with Alternative 1 would not occur under this alternative. The protection afforded by improved roads, fences, and vehicle barriers intended to increase the efficiency of the BP, would benefit habitats that support wildlife.

On the other hand, without the enhanced patrol operations proposed in Alternative 1, indirect impacts would continue to occur. In addition, an increase in lighting operations in certain areas could have potential effects on wildlife populations by altering circadian rhythms, disrupting movement, and increasing predation potential. Predation potential would increase since the

Table 4-3. Projected Direct Losses to Wildlife Populations in the Study area From Proposed Habitat Alterations under Alternative 1

Project Type	Impact (Acres)	Lizards[1]	Birds[1]	Mammals[1]
		(Individuals Impacted)		
Road/ construction and or upgrades	209	2,926	188	119
Primary fence barriers (pedestrian Fencing and/or vehicle barriers with a 10-feet maintenance road)	60	840	54	34
All-weather maintenance road	8	112	7	4
Secondary fencing enclosing the border area	222	3,108	200	127
International ditch upgrade	2	28	2	1
RVS Sites	2	28	2	3
Stadium lights (area of illumination)	334	4,676	300	190
Portable lights (area of illumination)	96	1,344	86	54
Rescue beacons	0.004	0	0	0
New Station	40	480	36	22
Drag Roads	44	616	40	25
Totals (% estimate for Study Area)	**1,017 --**	**14,238 (<1%)**	**915 (<1%)**	**579 (<1%)**
Total Population Estimate for Study Area[2]	**--**	**173,964,000**	**11,183,400**	**7,082,820**

[1] Maximum lizard density 14 individuals/acre; maximum bird density 0.90 individuals/acre; maximum small mammal density 0.57 individuals/acre-density estimates rounded to nearest integer;
[2] Total area of study area is estimated to be 12.426 million acres (19,416 square miles)

Source: US Army 1994 and GSRC 2003.

lights would illuminate prey. The magnitude of the effects of lighting projects would depend upon the season, duration, location, intensity, and direction of the lighting. Under Alternative 2, approximately 334 acres (in addition to the 587 directly impacted acres) would be illuminated. Table 4-4 presents estimates of individual wildlife that could be lost from direct impacts as a result of this alternative. It should be emphasized, however, that these are upper extreme case estimates. It should also be noted that these losses could occur throughout the entire study area and that individual numbers represent several different species.

4.4.2.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

The activities associated with Alternative 3 would not create direct significant impacts to fish and wildlife resources throughout the ROI because construction of infrastructure would not occur. Loss of habitat as a result of the expansion of operations and existing and technology-based

Table 4-4. Projected Direct Losses to Wildlife Populations in the Study area From Proposed Habitat Alterations under Alternative 2

Project Type	Impact (Acres)	Lizards[1]	Birds[1]	Mammals[1]
		(Individuals Impacted)		
Road / construction and or upgrades	209	2,926	188	119
Primary fence barriers (pedestrian fencing and/or vehicle barriers with a 10-feet maintenance road)	60	840	54	34
All-weather maintenance road	8	112	7	4
Secondary fencing enclosing the border area	222	3,108	200	127
International ditch upgrade	2	28	2	1
RVS sites	2	28	2	3
Stadium lights (area of illumination)	334	4,676	300	190
Portable lights (area of illumination)	0	0	0	0
Rescue beacons	1.004	0	0	0
New Station	40	480	36	22
Drag Roads	44	616	40	25
Totals (% estimate for Study Area)	**921 --**	**12,814 (<1%)**	**829 (<1%)**	**525 (<1%)**
Total Population Estimate for Study Area[2]	**--**	**173,964,000**	**11,183,400**	**7,082,820**

[1] Maximum lizard density 14 individuals/acre; maximum bird density 0.90 individuals/acre; maximum small mammal density 0.57 individuals/acre-density estimates rounded to nearest integer;
[2] Total area of study area is estimated to be 12.426 million acres (19,416 square miles)

Source: US Army 1994 and GSRC 2003.

systems (*i.e.*, RVS, lighting systems) would occur. Although impacts could occur to wildlife due to this alternative, direct impacts would be less than those associated with Alternative 1. Conversely, indirect impacts associated with by the continued and potentially increased levels of illegal foot and vehicle traffic could damage wildlife communities north of the border due to the lack of deterrence (*i.e.*, fences and all weather roads) and increased apprehension activities. In the absence of infrastructure illegal traffic would be expected to increase and apprehensions would occur north of the border; therefore, off-road enforcement actions would be expected to increase. Increases in off-road activities would have a potential adverse affect on wildlife and wildlife habitats. Impacts associated with increasing operations would be similar to those described for Alternative 1.

4.4.3 Threatened/Endangered Species and Critical Habitats

The BP coordinates with the USFWS early in the planning process for all potentially significant actions. All NEPA documents prepared by the BP are regularly submitted to the USFWS and all

appropriate Federal and state resource agencies for review. These documents contain information regarding the results of surveys for protected species and/or suitable habitat that may occur within the study area. For example, a BA prepared as part of Section 7 consultation for the BP Yuma Sector, Wellton Station operations was finalized in 1999, and consultation has recently been reinitiated (October 2002). A BA was also recently prepared for the BP Tucson Sector operations (INS 2002d) and submitted to the USFWS for initiation of formal Section 7 consultation. These assessments not only addressed potential effects to protected species, but also identified changes in daily BP operations that would be implemented to avoid or mitigate any effects. The BP will continue to coordinate with the USFWS Ecological Services Field Offices in Phoenix and Tucson to address potential impacts to plans for reintroduction or recovery of protected species.

4.4.3.1 No Action Alternative

No direct impacts are expected to occur to threatened and endangered species or their habitats if the No Action Alternative is implemented since no future construction or operational activities would occur. However, indirect effects would continue due to IE activities. The rate of these indirect effects would increase as road conditions deteriorate and BP efforts to patrol remote areas are hampered or precluded. IE traffic may increase as a result of reduced patrol activities. IE traffic could result in loss and degradation of habitat and could cause incidental take of certain species. Species with the most potential to be affected include those inhabiting riparian areas. No new information regarding threatened or endangered species and their habitats would be collected because surveys would not be conducted as part of BP projects.

4.4.3.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

As stated previously, a BA for the Yuma Sector was submitted to the USFWS to initiate formal Section 7 consultation and a Biological Opinion is pending. The BP is currently preparing a BA for the Tucson Sector as part of the formal Section 7 consulation process. The expansion of BP operations could adversely affect the Sonoran pronghorn. In addition, expanded BP operations would not be expected to adversely affect, the cactus ferruginous pygmy owl, lesser long nose bat, southwestern willow flycatcher, Yuma clapper rail, and bald eagle. The expansion of BP operations would not be expected to affect Nichol's turk's head cactus, brown pelican, and razorback sucker.

The expansion of BP operations could adversely affect the lessser long-nosed bat, cactus ferruginous pygmy-owl, Mexican spotted owl, Huachuca water umbel, and Gila topminnow. Expanded BP operations would not be expected to adversely affect the jaguar, Pima pineapple cactus, masked bobwhite quail, and Chiricahua leopard frog. Impacts and mitigation efforts are documented in the Yuma and Tucson Sector BAs and are not considered to be of a magnitude that would jeopardize the continued existence of any protected species.

Because the Sonoran pronghorn population is critically low within the region, the expansion of BP operations such as off-road activities, air patrols, drag road activities, road patrols, and night patrols would be expected to have an adverse impact on the Sonoran pronghorn. Expanded operations would increase the presence of BP agents and vehicles in Sonoran pronghorn habitat, thus increasing the potential to disturb resting or foraging pronghorn. However, ongoing dragging operations would have minimal adverse impacts to the pronghorn; in fact, dragging would have a beneficial impact, since it has an indirect result of increased forb production due to changes in hydrology within microsites.

The operations and approved construction activities within the Yuma Sector AO would impact the state-protected flat-tailed horned lizard. Of the five designated management areas for this species, only two are within the study region: BMGR-East, BMGR-West, and an area along the Colorado River five miles north of and paralleling the US-Mexico border. Mitigation for impacts to the flat-tailed horned lizard habitat within the Conservation Areas would be required.

Under Alternative 1, several existing and approved BP activities and RVS sites are located within designated critical habitat for various protected species. Table 4-5 defines the proposed activity, along with its general location and potential area of impact.

Subsequent infrastructure projects as well as technology-based systems that may potentially affect threatened and endangered species or designated critical habitat may require Section 7 consultation with the USFWS. Consultation would be conducted on a site-specific basis. For example, approved roadway improvements and vehicle barrier installation are proposed to cross designated critical habitat for the Mexican spotted owl in the Naco Station's AO.

Table 4-5. Approved Activities Potentially Affecting Designated Critical Habitat under Alternatives

Proposed Activity	Station	Protected Species	Area Impacted (ft^2)	Area Impacted (acres)	Impact by Alternative		
					Alt 1	Alt 2	Alt 3
Vehicle Barrier Installation/Road Improvement	Naco	Mexican spotted owl	8,712	0.2	✓	✓	
1 RVS Installation	Naco	Mexican spotted owl	1,500	0.03	✓	✓	✓
Total Critical Habitat Impacted			**10,212**	**0.23**			

Quantification of direct impacts to threatened and endangered species resulting from the expansion of dragging operations, off-road activities, road patrols, and air operations cannot be accurately predicted for Alternative 1 at this time. The expansion of operations would be expected to increase the potential for adverse impacts to protected species. For major construction projects where protected species are known or presumed to occur, the BP would use biologists to monitor construction progress and conduct post project, long-term monitoring, as deemed necessary. Monitoring activites would be coordinated with USFWS and the appropriate state resource agencies. Additional NEPA documentation tiered from this revised draft PEIS would be completed prior to any maintenance or construction activities, as determined to be appropriate on a project-by-project basis.

4.4.3.3 Alternative 2. Expand Technology-Based Systems and Approved Infrastructure

Direct impacts to threatened and endangered species or critical habitat associated with this alternative would be similar in nature to Alternative 1; however, these impacts would be less, as no additional operations would occur. Implementation of Alternative 2 would create less overall direct impacts to threatened or endangered species caused by additional border monitoring patrols, dragging operations, and routine aerial support, because much of the border would be monitored remotely. However, the indirect impacts would be greater than Alternative 1 as agents would still be required to pursue IEs as they are detected upon entry into the US. Although this alternative would allow for a concentrated effort in apprehensions, the likelihood of IEs entering the US and being able to proceed northward away from the border into sensitive habitat that supports threatened and endangered species or their critical habitat is probable. Thus, additional indirect impacts through trampling of vegetation, fires, and subsequent BP operations would be created. The amount of impacts caused by the lack of additional

operations is not quantifiable; the method and occurrence of illegal actions is determined by the IEs.

4.4.3.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

Under Alternative 3, no major infrastructure construction activities would be implemented (*i.e.*, roads and fences), and consequently, no direct impacts to protected species or their habitats would occur due to loss of habitat. However, impacts to protected species from RVS and other technology-based systems would occur. Impacts from the installation and operation of technology systems and possible special operations would be addressed in project specific NEPA documents. Biological surveys would be completed as part of the NEPA process.

The expansion of operations would result in impacts similar to those described for Alternative 1. Indirect impacts to protected species resulting from this alternative would be similar to that of Alternatives 1 and 2, but on a larger scale. These associated impacts would be the result of the lack of significant deterrence measures being implemented, causing illegal traffic to continue and potentially increase. The lack of infrastructure would result in pursuits and apprehensions north of the border in protected species habitat. Off-road pursuits would likely increase in response to illegal traffic traveling cross-country to avoid detection.

4.5 UNIQUE AND ENVIRONMENTALLY SENSITIVE AREAS

4.5.1 No Action Alternative

Direct impacts are expected to occur to unique and environmentally sensitive areas if the No Action Alternative is implemented. Unique and environmentally sensitive areas that are currently impacted by operations will continue to be impacted to the same or a greater degree. Direct impacts, as a result of approved construction and/or maintenance activities to these areas, would be eliminated upon implementation of this alternative. However, indirect adverse effects would continue due to illegal traffic and subsequent BP enforcement actions. As discussed in Section 1.2, the constant flow of IEs passing through the US-Mexico border area threatens environmentally sensitive areas, such as, but not limited to the CPNWR, OPCNM, Coronado National Memorial and the SPRNCA (see Figures 1-5 and 1-6). These effects have been, and would continue to be, significant adverse effects on the wilderness qualities.

4.5.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

Under Alternative 1, several existing and approved BP infrastructure projects are located within unique and environmentally sensitive areas. Table 4-6 defines the proposed activity, along with its location and potential area of impact. The BP must consult with the appropriate agencies prior to any construction activities within these areas. Under Alternative 1, approximately 4.8 acres within unique and environmentally sensitive areas would be impacted directly from approved infrastructure. Approximately 4.2 acres would be permanently altered through the installation of the vehicle barriers, maintenance roads, low-water crossings, and all-weather road upgrades and 0.6 acre impacted from RVS installation.

Table 4-6. Proposed Activities Potentially Affecting Unique and Environmentally Sensitive Areas under Alternatives

Proposed Activity	Station	Unique/Sensitive Area	Area Impacted (square feet)	Area Impacted (acres)	Impact by Alternative			
					Alt 1	Alt 2	Alt 3	No Action
1 RVS installation	Nogales	Coronado National Forest (Pajarita Mountains)	1,500	0.2	✓	✓	✓	
Vehicle Barrier Installation/Road Improvement	Naco	San Pedro Riparian National Conservation Area	182,952	4.2	✓	✓		
1 RVS installation	Naco	San Pedro Riparian National Conservation Area	2,500	0.2	✓	✓	✓	
1 RVS installation	Naco	Coronado National Memorial (Montezuma Ranch)	900	0.2	✓	✓	✓	
Total Area Impacted			**192,352**	**4.8**				

The expansion of operations such as increased access on the OPCNM and CPNWR, increased off-road patrols, and increased air patrols would have a potentially significant negative affect on unique and sensitive areas. Increased access and off-road patrols would significantly adversely affect designated Wilderness Areas on the OPCNM and CPNWR. The magnitude of the impact would depend on the time of year and duration of the activity. Other sensitive areas in the study area could be adversely affected as a result of expanding operations. Increased dragging operations and road patrols could disrupt visitor experience at National Parks, National Monuments, Wilderness Areas, and National Forest.

Beneficial indirect effects associated with the implementation of this Alternative would be a potential increase in crime deterrence; therefore, limiting the total amount of impacts caused by illegal traffic through these areas. The camps of IEs can negatively impact sensitive areas from food and wood gathering and the potential for wildfires in wooded areas. Cactus poachers and smugglers of endangered species like to work in remote areas where they do not fear detection. Although these activities are outside of the primary BP mission, the increased presence of BP agents should serve as a deterrent to environmental crimes as well.

4.5.3 Alternative 2. Expand Technology-Based Systems and Approved Infrastructure

Implementation of Alternative 2 would result in similar direct impacts as Alternative 1. Beneficial indirect impacts would result due to the decrease in landscape alternations by IEs in unique and sensitive areas. Similar to Alternative 1, the BP must consult with the appropriate agencies prior to any construction activities.

4.5.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

Under Alternative 3, approximately 0.6 acre of unique or sensitive areas would be directly impacted due to the installation of RVS systems. These impacts, however, should be small and limited to the footprints of the RVS towers.

Increased operations could adversely impact unique and sensitive areas, depending upon the type and duration of the operation. Increased off-road access, road dragging, and road patrols on the CPNWR and OPCNM would have a potential significant adverse affect on designated Wildernes Areas, a national wildlife refuge, and a national monument. BP agents are mandated to make every practicable attempt to apprehend IEs; consequently, agents must enter unique and sensitive areas, often in vehicles or on ATVs, in their pursuit of IEs. Routine operations, however, can be performed in a manner that would result in minimal or no adverse impacts to unique and sensitive areas. For example, increased vehicular patrols could remain on existing roads and RVS systems could be be installed instead of increasing the use of drag road operations for tracking. However, without expanding infrastructure (i.e, roads and fences) the response time is not sufficient to apprehend IEs in proximity to the border. Therefore, BP agents must travel off-road to pursue and apprehend IEs north of the border.

4.6 CULTURAL RESOURCES

Arizona is very diverse and rich with prehistoric and historic resources. Consequently, the potential presence of properties eligible and potentially eligible for listing on the NRHP is high. A complete list of known NRHP properties is presented in Appendix E. In accordance with Section 106 of the NHPA and its implementing regulations, 36 C.F.R. Part 800, the BP customarily consults with the SHPO and other appropriate government agencies (*e.g.*, USAF, USMC, BLM, USFWS, USFS and NPS) prior to performing construction activities and, will also coordinate operations on military properties. The BP will also consult with the appropriate Native American tribes concerning the potential of impacts to TCPs, sacred sites, or other ethnographic resources prior to performing construction activities and operations where applicable. The BP will conduct surveys of all construction sites (temporary and permanent) prior to commencement of construction activities to ensure that significant archeological sites are avoided to the maximum extent practicable. If a site is unavoidable, other mitigation measures, such as, but not limited to, data recovery, are implemented with the concurrence of the Arizona SHPO and/or appropriate THPO, as well as Tribal Governments and Bureau of Indian Affairs (BIA), as applicable. By instituting the process of avoidance as the preferred mitigation procedure combined with monitoring during construction activities, impacts to cultural resources eligible or potentially eligible for listing on the NRHP will be minimized.

Some concerns have been raised that improved roads could lead to increased opportunities for looting or damage of archeological sites. However, enhanced patrol efforts in these areas allowed by the improved roads and completion of existing and approved infrastructure would reduce illegal traffic in the area and subsequently have a reduction in the potential for looting and damage of significant cultural resources. In addition, the use of artificial lighting in the areas of archeological sites will also reduce the opportunities for looting and damage of archeological sites and historic properties. The BP will cooperate with natural resources agencies to provide training (including educational video/DVD modules) for patrol agents to educate them on the importance of biological and cultural resources and ways to avoid impacts to such resources while conducting their normal operations. Bi-annual training shall be provided to all permanent personnel. Temporary personnel shall have training incorporated into their orientation briefings.

The predominance of existing and approved infrastructure would involve ground-disturbing activities during construction. The infrastructure improvements involving ground-disturbing activities include construction of fences (including landing mat, bollard, and decorative fences), vehicle barriers, helipads, new stations and station expansions, stadium lights, sensor placement, RVS sites, operational repeaters, tactical checkpoints, and general road maintenance. Clearing of vegetation along the border in certain areas would also involve some degree of ground disturbance. All existing and approved infrastructure have the potential for visual impacts in the area and could have impacts on the cultural landscape, rock-art, TCPs, and sacred sites.

Operations in the study area and illumination from lights generally do not adversely impact archeological and historical sites. Patrol and apprehension activities limited to existing roads have little potential to impact cultural resources in the area. Keeping these activities limited to the road would avoid undisturbed significant cultural resources, thus minimizing any direct adverse effects to cultural resources within the area. Off-road activities, including turn arounds and pullovers, have a greater potential to adversely impact known or unknown cultural resources. BP agents would typically not be cognizant of recorded or unrecorded sites and, during off-road pursuit or SAR missions, could inadvertently impact these resources. Such activities shall be limited to the greatest extent practicable in order to avoid negatively impacting unknown cultural resources. Air operations within the study area would have no adverse effects on archeological or historic sites, but do have the potential to impact TCPs, rock-art, or sacred sites. Such potential impacts and appropriate mitigation measures would be identified in consultation with the appropriate Native American tribes. Ongoing coordination with Federal and state agencies will also be conducted in order to identify areas of avoidance and thus further minimize impacts to cultural resources from BP operations. Impacts to cultural resources will be quantified on a project-by-project basis with subsequent NEPA documentation tiered from this programmatic document, as appropriate.

The surveys and analysis performed for BP projects significantly adds to the knowledge base of the history and prehistory of the southwest. Without these activities and the required surveys, much of this information would never be obtained or would be improperly recovered by amateur archeologists. This is especially true on private lands where there are no requirements for landowners to conduct routine surveys.

4.6.1 No Action Alternative

Section 106 and NEPA compliance analyses were conducted for specific past and current activities, as applicable. Prior to any ground disturbing activity, a full literature and records check for known "historic properties" and a full survey of the study area was conducted to record any unknown archeological sites. All archeological sites that were determined either potentially eligible or eligible for the NRHP within the project areas were either avoided or potential impacts were mitigated, resulting in no adverse effect to any known significant cultural resources under the No Action Alternative.

Under the No Action Alternative, there is a high likelihood of increased IE traffic, both pedestrian and vehicular, to occur in off-road areas, as BP enforcement actions would be hindered. This illegal off-road traffic could cause significant short and long-term adverse impacts to known and unknown cultural resources sites. Indeed, numerous sites on the TON have already been impacted by IE traffic (Steere 2004). Similar impacts to cultural resources sites, including sacred sites and other TCPs throughout the study area, would be expected to increase dramatically. The increased illumination from stadium and portable lighting (totaling 430 acres) would probably deter looting of sites and the destruction of sites through illegal traffic, and thus, has a positive effect on the cultural resources of the study area.

4.6.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

Under Alternative 1, approximately 921 acres (exclusive of portable lights) would be subject to ground disturbance that could potentially impact cultural resources. Archeological records were checked as part of the Section 106 process conducted during the NEPA planning process for approved projects. The archeological records check included, but was not limited to, site and project records on file with the Arizona SHPO, Arizona State Museum, NPS, BMGR, USFWS and any historical maps on file with the BLM that could show potential locations for historic structures. Consultation has been done with the Native American tribes that claim a cultural affinity to the area in order to determine the presence of any TCPs, sacred sites, or other ethnographic resources within the proposed project area. In addition, intensive archeological surveys were conducted on areas that had not been previously surveyed and where ground-disturbing activities would take place. All archeological sites found during the surveys were recorded and the NRHP elgibility determination was made for each site. The BP would avoid sites where sufficient information was not available to make a successful NRHP eligibility

determination. If they cannot be avoided, other mitigation measures for these sites would be necessary. Mitigation measures will be developed in consultation with the Arizona SHPO, THPO, Native American tribes and other interested parties where applicable. Monitoring in the vicinity of these sites during ground disturbing activities would provide an additional safeguard in avoidance of any adverse impacts to these sites. It should be emphasized that most of the road and fence projects performed by the BP are repair and upgrade projects. Therefore, most of the ground disturbing activities would be in areas that have been previously disturbed and/or surveyed.

Alternative 1 would consist of an additional 430 acres of illumination for a total of 2,320 acres when combined with the 1,890 acres of existing illumination. Consideration of visual impacts to historic properties were taken into account during the placement of lights. Illumination would not be expected to have adverse effects on any cultural resources within the project corridor provided the lights are placed at an adequate distance from known historic sites (see Appendix E) and properly coordinated through the Arizona SHPO along with the appropriate THPO and/or Native American Tribes where applicable. Lighting has the potential beneficial effect of deterring looting and damage to sites from intentional and unintentional illegal activity.

Increases in off-road enforcement actions would potentially cause significant impacts to unknown cultural resources within the study area. The increased patrols and infrastructure would provide faster response time for BP agents and would result in shorter apprehension times. IEs would be apprehended closer to the border, which would potentially decrease the number of impacts to cultural resources located away from the border. Any impacts for special operations would be addressed with project specific NEPA and Section 106 documentation and tiered from this programmatic document. Control of the border and IEs would reduce long-term impacts.

Density of sites varies greatly throughout Arizona depending upon topography, available water sources, available sources for tool-making, and suitable habitat for vegetation/wildlife populations. However, for comparison purposes, if it is assumed that the average site density is 0.07 sites per acre (based on previous survey results within the corridor). Because off-road patrols do not occur along predetermined routes, it is difficult to determine the area of disturbance. However, off-road patrols would be expected to potentially encounter additional

cultural resources sites, as previously mentioned, and could result in significant adverse impacts to unknown cultural resources sites.

4.6.3 Alternative 2. Expand Technology-Based Systems and Approved Infrastructure

Under Alternative 2, there would be expansion of the use of ongoing and technology-based systems and completion and maintenance of current infrastructure. Direct impacts would be similar to Alternative 1. Ground disturbing activities from construction would be 587 acres. The potential for expanded operations to affect unknown cultural resources sites would not occur under Alternative 2. Placement of lights near structures listed on the NRHP were coordinated with the Arizona SHPO to ensure that the visual qualities of the historic structures are not impaired. Consultation will be conducted with the appropriate Native American tribes in order to identify any TCPs, sacred sites, or other ethnographic resources that may be impacted. Illumination from stadium and portable lights would be similar to that described for Alternative 1.

Section 106 coordination has been completed for existing and approved infrastructure activities that could potentially impact both archeological and historic sites. Prior to construction, an archeological records check will be conducted in all areas where ground disturbance is planned. The archeological records check includes, but is not limited to, site and project records on file with the Arizona SHPO, ASM, USFWS, BMGR, NPS, and any historical maps on file with the BLM that could show potential locations for historic structures. In addition, an intensive archeological survey will be conducted in areas that have not been previously surveyed and where ground-disturbing activities will take place. All archeological sites found during those surveys will be recorded and enough information collected to make a determination on whether they meet the criteria for potential inclusion on the NRHP. All sites that meet the criteria for inclusion on the NRHP and those that do not have enough information to make a successful NRHP-eligibility determination would be avoided. If these cannot be avoided, other mitigation measures for these sites will be necessary. Appropriate mitigation measures for these sites would be developed in consultation with the Arizona SHPO, the THPO, and/or the appropriate Native American tribes. Monitoring in the vicinity of these sites during ground disturbing activities will provide an additional safeguard to these sites.

Maintaining off-road enforcement activities at the current level would not result in any additional impacts to unknown cultural resources within the study area. However, maintaing operations at status quo would result in longer apprehension times, which would increase the operational

footprint of the BP. As a result, illegal foot and vehicle traffic would extend further away from the border, potentially impacting cultural resources over a greater area as compared to Alternative 1. This would result in an increase of potential impacts on archeological and historic sites through either illegal pedestrian or vehicular traffic or from increased off-road pursuits that would be needed in apprehension. Impacts for specific projects would be addressed in project-specific NEPA and Section 106 documentation, which would be tiered from this programmatic document.

4.6.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

Under this alternative the operations (including technology-based operations) and activities would be increased and no new infrastructure would be constructed. The construction technology-based systems would result in approximately 2 acres of ground disturbing activities. Direct impacts impacts would be considerable less than Alterntive 1 in the absence of infrastructure.

Portable lights would have no potential impact on any archeological sites if they were kept within the bounds of existing road ROWs and outside boundaries of known archeological sites. Placement of lights near structures listed on the NRHP will need to be coordinated with the Arizona SHPO to ensure that the visual qualities of the historic structures are not impaired. Consultation will be conducted with the appropriate Native American tribes in order to identify any TCPs, sacred sites, or other ethnographic resources that may be impacted.

Increases in off-road enforcement actitives would result in impacts similar to those described for Alternative 1. A large amount of pedestrian and vehicle traffic is expected under this alternative in comparison to Alternatives 1 and 2. The reduction in additional barriers would allow more illegal traffic to pass freely over the border, particularly vehicular traffic. This would result in the increased potential for significant impacts to archeological and historic sites through either illegal pedestrian or vehicular traffic, or from off-road pursuits required to apprehend the IEs. Furthermore, new roads and improvements to existing roads would not be completed under Alternative 3, which would increase the response time of BP agents. This would result in longer apprehension times and a larger operational footprint. As a result, cultural resources would potentially be significantly impacted over a larger area. Impacts for special operations and

technological projects would be addressed with project specific NEPA and Section 106 documentation as appropriate and tiered from this programmatic document.

4.7 WATER RESOURCES

Water resources within the area encompassed by the revised draft PEIS are limited, and concerns regarding adequate supplies and quality are increasing. Impacts to water resources would be dependent upon the location of specific projects in relation to water bodies. Potential direct and indirect impacts to water resources from infrastructure and operations projects have been addressed on a project-by-project basis. Indirect impacts such as dust, stormwater run-off, erosion, accidental spills, and other such activities have the potential to impact surface water resources and wetlands in the project area. Site-specific surveys of potential impact areas have been conducted to determine jurisdictional wetlands, waters of the US, and other water resources that may potentially be impacted by infrastructure projects.

4.7.1 No Action Alternative

The No Action Alternative would continue to have an indirect impact on water resources in the project area. Water withdrawal for daily operations in the Upper San Pedro Basin would continue to contribute to the ground water deficit in this water basin. The BP would continue to patrol roads until they become impassable. Without the road improvements, erosion and sedimentation would continue and, perhaps, increase. The magnitude of indirect impacts would depend upon the rate of erosion and the location and intensity of patrol routes relative to rivers and other drainages.

4.7.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

The deployment of personnel for construction, maintenance, or patrol operations within the study area would result in an increased use of limited water resources in some regions. Most of the proposed construction and maintenance actions are anticipated to be relatively short and infrequent, and therefore, they are not expected to contribute to long-term impacts to groundwater supplies. However, in groundwater basins that are experiencing a recharge deficit, such as the Upper San Pedro Basin, any additional water use would contribute to the deficit and could result in long-term impacts, especially if annual deficits continue. The significance and extent of impacts to water resources would be evaluated on a project and site-specific basis. In some cases, coordination with state and local agencies, as well as conformance with Federal

regulations regarding surface water impacts, will be required. All proposed works and projects would be coordinated with the USIBWC for review and approval. Notification and permitting procedures for specific proposed actions and projects will be evaluated for each site-specific construction project proposed prior to commencement of activities (*e.g.*, prior to installation of water wells at tactical checkpoints and other facilities).

Increases in BP agents at the Naco Station would increase the amount of water withdrawn from the Upper San Pedro Basin, thus contributing to the groundwater recharge deficit. The USEPA estimates that each individual in the basin uses approximately 155 gallon/day (USEPA 2004). The BP would be responsible for mitigating this amount of water usage per person for the Naco Station. Personnel would be apprised of applicable water-conservation practices, and construction equipment would be maintained and configured for best efficiency in water-limited areas. Water management practices have been proposed for the expansion of BP air operations at Fort Huachuca Libby Airfield/Sierra Vista Airport. Water use in other groundwater basins with a deficit, such as the Upper San Pedro Basin, would be mitigated. Mitigation measures could include, but not limited to low flow faucets, low flow toilets, xeriscape techniques, and effluent recharge facilities or septic tanks. Best management practices (BMPs) for preventing contamination from stormwater runoff will be specified in mitigation plans. These plans will also address hazardous substances and/or contaminated material spills.

Since Alternative 1 has more construction projects and expansion of operational activities associated with it than the other four alternatives, it follows that Alternative 1 would have the greatest potential to directly affect water resources. The use of large amounts of groundwater for construction activities could contribute to current deficits in the affected aquifer. Impacts to waterbodies from stormwater run-off or accidental spills during construction operations would be one of the more significant effects. The magnitude of these effects would depend upon the size, type, and duration of the construction project, timing, weather conditions, vegetative cover, and soil type. A SWPPP and other erosion control measures, as described previously and in Chapter 6, will significantly reduce the potential of adverse impacts to nearby water resources.

Construction of BP stations and other permanent facilities would demand additional water and sewage treatment capacities. The increased water demands of new and expanded stations would need to be analyzed relative to the hydrologic effects on sensitive surface waterbodies, such as the San Pedro River. Site-specific NEPA documents would address these needs to

ensure that existing treatment facilities would be capable of handling the additional flows without causing a permit violation. Some facilities may require individual treatment systems (*e.g.*, septic tanks, oxidation ponds, etc.); these treatment systems would require permits from the appropriate agencies.

Major surface waters potentially impacted by proposed infrastructure include, but are not limited to: proposed road construction/maintenance near the Santa Cruz River; proposed road construction/maintenance, fence, and stadium style and portable generator lights near the San Pedro River; and proposed road construction/maintenance and proposed portable generator lights, stadium style lights, and fence near the Colorado River.

Potential impacts include siltation from stormwater runoff, erosion, and accidental spills or leaks. However, due to the small area affected by each RVS or portable light generator site, potential impacts to nearby water resources, if they occurred, would be negligible. Implementation of BMPs; Spill Prevention, Containment, and Countermeasures Plans (SPCCP); and SWPPPs, will also reduce these risks.

Increased operations could have direct and indirect effects on water resources. Off-road SAR and/or apprehension activities could temporarily affect surface water resources if vehicles have to traverse streams. These effects are difficult, if not impossible, to quantify. The magnitude of the effects would depend upon the number of times the stream or waterbody is crossed, type of vehicle, season, and the size and condition of the stream/water body. It must also be noted that "engineer-designed" low-water crossings would be constructed in stream or waterbodies where road upgrades are planned. Therefore, the magnitude of effects is expected to be reduced in areas that would experience road improvements.

Portable light generators would not be placed within 0.25 mile of an intermittent or permanent stream or water body. Thus, the potential for impacts from accidental spills during their operation would be eliminated. Other equipment, including vehicles, would be staged away from arroyos, streams, drainage channels, and other water bodies, to the extent practicable. Infrastructure and operations within floodplains would require further assessment and may require permits.

4.7.3 Alternative 2. Expand Technology-Based Systems and Approved Infrastructure

Implementation of this alternative would reduce the potential for water resources to be adversely impacted. As with Alternative 1, construction of infrastructure such as roads and fences would be responsible for majority of the water requirements under this alternative. Since the focus of this alternative is to reduce the operational tempo of the Sector through efficient use of technology, water required for general operations such as vehicle washes, drinking water, and even dust suppression would be reduced. Potential impacts to the Upper San Pedro Basin would be less than those expected under Alternative 1. Estimates of the impacts to water resources that would be impacted are unknown without project-specific analyses in areas where construction is proposed. Impacts based on upper extreme case scenarios are unreliable because impacted areas may not contain nearby water resources. Impacts to water resources would be addressed in site-specific NEPA documents. All proposed works and projects would be coordinated with the USIBWC for review and approval.

Major surface waters potentially impacted by approved and ongoing operations and infrastructure would be less than those identified in Alternative 1. Potential impacts include siltation from stormwater runoff, erosion, and spills or leaks. However, if these impacts occurred, they would be minor since the implementation of BMPs, SWPPP, and SPCCP will reduce these risks. Infrastructure and operations within floodplains would require further assessment and may require permits.

4.7.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

Impacts to water bodies from this alternative would be limited mostly to non-point source sedimentation from eroding road surfaces and other indirect effects, while the impacts to water sources by the expansion of operations and technology systems would be similar to Alternative 1. The magnitude of operational effects would depend upon the number of vehicle miles, timing, weather conditions, adjacent vegetation cover and soil type. Employment of good maintenance practices for unsurfaced roads and trails, as well as other erosion control measures, would significantly reduce the potential of adverse impacts to water resources. Environmental design measures are described further in Chapter 6.

Construction of a new BP station and several tactical checkpoints and camps would be needed under Alternative 3. Construction of the BP stations would demand additional water and sewage treatment capacities. The increased water demands of new BP stations would need to

be analyzed relative to the hydrologic effects on water resources. Site-specific NEPA documents would be required to address these needs to ensure that existing treatment facilities would be capable of handling the additional flows without causing a permit violation. All proposed works and projects that affect international streams would be coordinated with the USIBWC. Some facilities may require individual treatment systems (*e.g.*, septic tanks, oxidation ponds, etc.); these treatment systems would require permits from the appropriate agencies. Tactical checkpoints and camp details generally bring in potable water and have temporary sewage facilities. Thus, neither would have increased water demands or additional onsite sewage treatment/discharge effects. Infrastructure and operations within floodplains would require further assessment and may require permits.

4.8 AIR QUALITY

Pollutant emissions estimates for industrial sources operating within 50 miles of the US-Mexico border study area are substantial, and probably represent only a portion of the total pollutant emissions. Air pollutant emissions from mobile sources (*e.g.* automobiles, aircraft, construction equipment) and other widely dispersed activities (*e.g.* open burning, wind blown dust) are also substantial in these areas. Many sources are not controlled, particularly in Mexico, but nevertheless have impacts on the study area. Proposed actions by the BP in these areas must be evaluated on a site-specific basis prior to construction through proper NEPA documentation. These evaluations may include air quality dispersion modeling to assess the impacts on air quality from additional mobile and stationary sources. Coordination with Federal and state regulatory agencies would be imperative to ensure proper notification, permitting, and documentation of potential impacts to air quality.

Equipment used for transporting materials and personnel during construction deployments, construction, and surveillance support operations utilize hydrocarbon fuels and internal combustion engines that emit air pollutants. Proposed mobile sources presented in the alternatives include cars, trucks, helicopters, and small aircraft. As discussed in Section 3.6, the main pollutants of concern for mobile source operations are CO, $PM_{10,}$ and SO_2. Travel along unpaved roads and soils disturbed during construction and road dragging result in the release of airborne particulate matter. Equipment and vehicles to be used for all proposed actions would be configured and maintained to conform to state and local air quality requirements.

Operational emissions would result from mobile sources and on-site stationary sources. Fugitive dust emissions might increase as a result of expanded operations. These emissions would result from increased patrols on unimproved roads and road dragging. USEPA and state agency guidelines provide screening criteria for determining whether a detailed analysis and permitting would be required. BP procedures for determining air quality impacts relate to the attainment status of the county where future operations/infrastructure are proposed. Procedures and impact estimates are based on pollutants that would occur in or near non-attainment areas and the proposed actions/source of pollution that could worsen the attainment levels. For example, portions of the study area are in non-attainment for PM_{10}; therefore proposed actions within those areas should document all sources of fugitive dusts associated with the action and evalute the impact on PM_{10} attainment levels. Pollutants that are in non-attainment status would be analyzed as specified by the general conformity rule of the CAA.

4.8.1 No Action Alternative

The No Action Alternative would eliminate all potential emission sources associated with BP construction activities and future increases in operational support services within the study area. As mentioned above, however, unimproved roads could increase fugitive dust levels that could exacerbate conditions within non-attainment areas. The short duration of construction/ maintenance activities and dust suppression measures utilized during past construction (*e.g.* water trucks), the type of equipment used, and the good dispersal patterns of the region indicate that long-term impacts associated with air emissions have been minimal. While the No Action Alternative would eliminate all potential emission sources associated with future and approved construction projects, routine maintenance to existing roads and dragging activities would continue, resulting in negligible impacts. No further impacts, beneficial or adverse, are expected to occur under the No Action Alternative.

4.8.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

Through implementation of this alternative, construction of existing and approved projects are anticipated to be relatively short in duration and, therefore, are not expected to contribute to long-term air quality impacts. Increases or impacts on ambient air quality during construction and maintenance activities are expected to be short-term and can be reduced further through the use of standard dust control techniques, including roadway watering and dust suppressants. Air quality analyses for the approved infrastructure projects have indicated that hydrocarbon,

SO_x, NO_x, and PM_{10} emissions would be far below *de minimus* thresholds and, thus, an air conformity analysis would not be required.

Fugitive dust emissions would be expected to increase as a result of expanded operations. These emissions would result from expanded off-road enforcement activities, increased patrols on unimproved roads and dragging operations. Naturally occurring windblown dust from dry soils is inherent to southern Arizona and is more problematic during extended drought conditions. Air quality impacts from construction and maintenance activities (roads, fences, vehicle barriers, stadium lights, RVS sites, portable generator lights) include emissions due to fuel combustion from heavy equipment and fugitive dust due to travel through the area. Based upon the current air quality status of the project area, the pollutants of special concern are airborne particulate matter. Many of the approved projects under consideration involve improving existing roads by making them all weather roads, which would decrease the amount of airborne particulate generated under Alternative 1.

The operation of drag roads would be the single largest air quality impact resulting from this alternative. The impacts to air quality resulting from dragging would be permanent unless active measures are taken to stabilize them once the roads are abandoned. Operation of the drag roads would create fugitive dust. Approximately 625 acres of roads are dragged on a regular basis in the Tucson and Yuma Sectors. Fugitive dust emissions would be expected to increase with the expansion of dragging.

There would be little or no emissions associated with operation of the stadium lights or RVS sites as these lights and RVS would be powered by non-emission generating sources (*e.g.*, existing electrical grid, natural gas, solar, etc.). Construction activities would be limited to pouring concrete pads, and the installation of the lights and RVS systems. The short duration of these activities, the type of equipment used, and the good dispersion patterns (air flow) of the region, indicate that air emissions would not be created that would adversely affect air quality in the ROI. Maintenance vehicles driving to and from the RVS sites and stadium lights would be the only emission source required by the operation and maintenance of the lights and RVS. Furthermore, in the event that the RVS power system is temporarily inoperable, emergency natural gas powered generators would power the RVS. EPA regulations exempt projects in non-attainment areas from general conformity requirements if the projected emissions do not exceed specified *de minimis* levels, which are based on a regions specific nonattainment

classification. These generators would not create emissions above the *de minimus* threshold and thus are considered insignificant impacts.

Approximately 202 diesel generators are currently used to power the portable lighting systems in the Tucson and Yuma Sectors, and would be in operation approximately 12 hours per day. The portable lighting unit typically consists of a 6-kilowatt diesel generator, which powers four 1000-watt lights on a 15-foot mast. Since diesel fuel contains inherently low amounts of fuel bound nitrogen, it is anticipated that installation of portable generators would not contribute to NO_x problems in the area. Other diesel generator pollutants of concern such as SO_2 and PM_{10}, would be expected to be far below the *de minimus* thresholds, and thus, no air conformity analysis would be anticipated.

Alternative 1 would result in an increase in the number of BP vehicles patrolling in the study area. Patrol actions would occur in proximity to the border due to early detection as a result of technology-based infrastructure. The additional vehicles would increase emissions level in the immediate patrol area; however, the proposed alternative is not expected to have a measurable impact on regional NO_x and O_3 levels. In areas that are chronically or acutely in violation of NAAQS, any additional contribution to air quality degradation could be considered significant and may require a conformity analysis and possibly mitigation.

4.8.3 Alternative 2. Expand Technology-Based Systems and Approved Infrastructure

This alternative promotes the use of technology-based systems and existing and approved infrastructure over traditional operations. The use of technology-based systems, fences, and other physical barriers under this alternative would have less direct and indirect impacts to air quality as that of Alternative 1. Mobile emissions as well as fugitive dust would be created on a short-term basis by the construction of approved infrastructure and continued BP apprehensions efforts. However, potential increases in fugitive dust emissions associated with expanded operations would not occur under Alternative 2. Without the expansion of operations, less vehicles, portable lights generators, and aircraft would be operating in the study area. Thus, NO_x and O_3 emissions would be less compared to Alternative 1. A combination of good dispersion patterns within the region and the use of BMPs and equipment that is in good working condition would insure that air quality within the ROI would not be significantly impacted under this alternative.

4.8.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

As mentioned previously, air pollutants of special concern for the study area are primarily airborne particulate matter. The ambient airborne particulate level under desert conditions is naturally high during certain seasons. Vehicle travel on un-surfaced roads is the primary non-agricultural contributor of airborne particulates from human activities. This alternative would result in increased fugitive dust emissions due to the lack of roadway improvements.

Alternative 3 would result in an increased number of surveillance vehicles and extended patrols, similar to that described for Alternative 1. These actions would create long-term minor impacts; however, the amount of these impacts would still be below the *de minimus* threshold, and thus, would be considered insignificant impacts. The number of vehicles would be increased over a large area, thus air dispersal would minimize a buildup of pollutants.

Increased off-road enforcement activities and road patrols resulting from an expansion of operations would be expected to increase fugitive dust emissions. As the number of vehicles and trips per day increase, fugitive dust, NO_x, and O_3 emissions would increase. In the absence of expanded infrastructure, off-road pursuits would be expected to increase, thus increasing fugitive dust emissions.

4.9 SOCIOECONOMICS

BP activities generally result in beneficial impacts to local, regional, and national economies. The diversity of past projects performed by the BP implies that socioeconomic impacts would vary considerably. Some projects have very small construction and operational impacts while others are more substantial (*i.e.*, construction costs, impacts, and project magnitude). The actual construction activity impacts are usually very localized due to the temporary nature of the construction activities and the fact that the predominance of labor for these projects in the past has been provided by the National Guard or Active and Reserve military units coordinated through the JTF NORTH. Consequently, the purchase of construction materials and supplies (increase in local sales and income) is typically the primary, direct economic effect in the project vicinity.

Although construction impacts are temporary in nature, the effects associated with implementation of BP projects are expected to continue for the economic life of the project. BP

actions provide socioeconomic benefits from increased detection, deterrence, and interdiction of illegal smuggling activities with concomitant benefits of reduced enforcement costs, losses to personal properties, violent crimes, and entitlement programs. These actions can produce subsequent indirect positive benefits from increased economic activity such as commerce, increased property values, and overall quality of life improvements as the activities of IEs are controlled.

Effects to the aesthetics and/or quality of life could be incurred in certain regions that experience significant new construction actions or increases in patrolling activities. These effects can be either positive or negative, depending upon an individual's opinion. The magnitude of perceptible effects, however, would be expected to increase in remote areas rather than in urban or developed areas. Increases in patrolling activities as well as construction activities near Wilderness Areas, parks, national monuments, and other such sensitive areas would cause the greatest adverse effects, although the impacts are difficult to quantify.

4.9.1 No Action Alternative

Most of the labor for completed infrastructure projects typically comes from either the National Guard or JTF NORTH Active/Reserve military units; hence, there are only temporary increases in the population of the project area. Materials and other project expenditures for the construction activities typically are obtained through merchants in the local community, further temporarily boosting the local economy.

A total of about 1,890 acres have been or would be illuminated under the No Action Alternative through the use of stadium and portable lighting authorized under previous documents including the Final EA for JTF-6 Proposed Lighting Project, Naco, Cochise County, AZ (USACE 1999a), Final EA JTF-6 Proposed Lighting Project, Yuma, Yuma County, AZ and Imperial County, CA (USACE 1999b), Final Environmental Assessment for the JTF-6 Proposed Fence, Lighting, and Road Improvement Project, Douglas, Cochise County, AZ (USACE 2001b), and Final Environmental Assessment-Portable Lights Within the Naco Corridor, Cochise County, AZ (INS 2001a). The added illumination has deterred drug smuggling, illegal immigration, and other illegal activity and is expected to have resulted in the reduction of the associated social costs of such activities. Approximately 229 portable generator lights would be operated in the Tucson and Yuma Sectors under the No Action Alternative. These portable light units run 12 hours a day consuming approximately 6 gallons of fuel each period. As a result, the operation of the

portable lighting uses approximately 1,374 gallons of diesel fuel daily for operation. Fuel purchased locally would continue to provide local economic benefits during their continued operation.

4.9.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

As mentioned previously, the National Guard or JTF NORTH Active/Reserve military units have completed the BP infrastructure projects to date. With the exception of construction labor for BP stations and some RVS towers, BP would be expected to continue to request these units. Private contractors may be used instead of military units for projects that the military units are unable to construct or those projects that do not have adequate training value. The relocation of the units would result in only temporary increases in the population of the project area. Materials and other project expenditures would likely be obtained through merchants in the local community, further temporarily boosting the local economy. Likewise an increase in the number of BP agents would have a positive effect on the local retail and service industries. Land acquisition would have to occur in certain areas to allow for the placement of RVS sites, roadway easements, as well as areas enclosed by barrier fencing

As part of the ABCI, up to 260 additional agents would be deployed throughout the Tucson Sector, and up to 320 BP agents would be deployed to the Yuma Sector under the current plan of the ABCI. This increase in agents would increase demand for housing. The effect of this increase would be most notable in small, rural towns where housing supply is limited, although the larger urban areas, which have greater infrastructure, would typically attract BP agents. The potential increase in housing demand would potentially elevate the price of housing in the larger developed areas, such as Sierra Vista, Nogales, and Yuma.

The construction of approved infrastructure would potentially remove private lands from the tax roles. Local, county, and state governments would lose tax benefits from private properties that have been purchased by the Federal government.

The additional illumination proposed for stadium and portable lights is expected to assist in the deterrence of drug smuggling, illegal immigration and other illegal activity, and subsequently result in the reduction of the associated social costs of such activities. The prevention of potential terrorists from entering the US has a nationwide positive effect. An increase in

operations in vehicle, pedestrian, and air operations would also require additional fuel and other resources for their continued operation. Increases in manpower at certain stations over the next few years would include a subsequent increase in supplies and other materials used in their daily operations. Most likely, these materials would be purchased from the surrounding communities and would increase revenues for the local economy.

In addition to existing stadium and portable lighting, 60 new 6-kilowatt diesel portable lighting units are scheduled for operation as documented in the Nogales Infrastructure EA (INS 2003d). Though these units would probably not be purchased locally, fuel for their operation would be supplied by local distributors. Portable light generators would operate for 12 hours a day and use an average of six gallons of diesel per generator during each 12-hour shift. This would require a total of 360 gallons of diesel fuel used daily in the operation of the proposed portable lighting units. Adding this to the fuel consumption of the 229 existing portable lighting units totals 1,734 gallons of fuel used daily in their operation. Fuel would be purchased locally and would provide ongoing local economic benefits during operation, through an increase in local fuel sales. Land acquisition would generate revenues for affected landowners. However, lands purchased by the Federal government would remove these lands from the tax base of the respective counties.

4.9.3 Alternative 2. Expand Technology-Based Systems and Approved Infrastructure

Similar socioeconomic effects, direct and indirect, would result upon implementation of this alternative as discussed for Alternative 1. Materials and other project expenditures would predominantly be obtained through merchants in the local community, serving as a temporary boost to the local economy. Substantially less construction would occur under this alternative compared to Alternative 1, thus, short-term economic benefits from construction activities and purchase of materials would be less.

The amount of stadium and portable lighting units under this alternative would remain the same as Alternative 1. By limiting traditional operations, control along the immediate border region would be limited, which would reduce the ability to deter IEs, and subsequently result in the reduction of the associated social costs of such activities. As mentioned above, about 360 additional gallons of diesel (total of 1,734 gallons annually) would be purchased locally for the

operation of the additional portable light generators. Ongoing, long-term economic benefits would result from the operation of these generators.

4.9.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

This alternative is expected to assist in the deterrence of illegal entry of potential terrorists, drug smuggling, illegal immigration, and other illegal activities, and subsequently result in a reduction of the associated social costs of such activities. An increase in vehicle, pedestrian, and air operations would also require additional fuel and other resources for continued operation. Increases in manpower at certain stations over the next few years, as proposed by this alternative, would include an increase in supplies and other materials used in daily operations. These materials would likely be purchased from the surrounding communities and would increase revenues for the local economy. Nearby communities are expected to experience reductions in operating expenses and increased revenue as a result of improved quality of life, improved property values, and subsequent increased commerce. Without the addition of fencing and other infrastructure along the border, illegal pedestrian and vehicle traffic could increase. The associated social costs of increases in crime and drug related activity would subsequently be expected to increase.

The amount of stadium and portable lighting units under this alternative would remain the same as both Alternatives 1 and 2. By eliminating the completion of existing and approved infrastructure, IEs would be able to cross more freely. Furthermore, no new roads or improvements to existing roads would be completed under this alternative. This would result in a longer response time by BP agents and would effectively increase the operational footprint. As a result, operations along the immediate border region would be limited to present levels, which would reduce the ability to deter IEs, and subsequently result in more associated social costs of such activities. As mentioned above, about 360 additional gallons of diesel (total of 1,734 gallons, annually) would be purchased locally for the operation of the additional portable light generators. Ongoing, long-term economic benefits would result from the operation of these generators.

The increase in operations will require an increase in the number of BP agents. An increase of 180 to 270 agents is expected across the Tucson Sector. The largest increase would occur at the Naco Station. Increases in the number of agents would put added demands on the local housing market. Because of the current housing shortage as reported by the Arizona Housing

Commission (2000), this action could result in higher housing prices in those areas receiving significant numbers of additional BP agents.

4.9.5 Executive Order 12898, Environmental Justice

Executive Order 12898 of February 11, 1994, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations," requires each Federal agency to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its proposed actions on minority populations and low-income communities (59 FR 7629).

As indicated earlier in Section 3.10 of this revised draft PEIS, the racial mix of the study area is predominantly Caucasian. Santa Cruz and Yuma counties have a significant portion of the population claiming Hispanic origins. These counties are particularly sensitive to environmental justice issues concerning minority populations. Particular attention would have to be made regarding the placement of infrastructure and other construction in proximity to minority populations. BP projects that have been completed and the current and future projects are sporadically located, based on strategic effectiveness, throughout the respective counties. Furthermore, none of the projects proposed or completed to date would have or has displaced minority residences or commercial structures in any community along the project corridor. Therefore, disproportionate effects to minority populations would not be expected. Communities such as Ajo, Gila Bend, San Luis and Yuma, due to their higher populations and commercial densities, would be particularly sensitive to environmental justice issues. Project specific impacts in regard to environmental justice would be addressed in site-specific NEPA documentation tiered from this programmatic document. Specific impacts cannot yet be identified from increasing operations or holding operations to current levels.

Since Alternative 1 consists of the greatest area of construction activities, it would have the most potential to encounter environmental justice issues. The construction in Alternative 2 is reduced and would therefore be less likely to encounter environmental justice issues. Under the No Action Alternative, all environmental justice issues have been addressed in previous compliance documentation, and there would be no additional impacts in regards to environmental justice. Alternative 3 would result in the least potential for environmental justice issues since only construction in support of increased operations would be initiated.

The study area has between 16.2 and 30.3 percent of its total population living at or below poverty levels. The 1997 per capita personal income was estimated to be between 57 to 83 percent of the national average. Therefore, it is likely that some infrastructure has been completed or is approved for construction near low-income neighborhoods. The location of these structures, however, is selected based on the frequency and intensity of potential IEs, and the need to protect these specific areas from IE.

Implementation of any of the alternatives would enhance the probability of success for the BP. The levels of enhanced success would vary among each alternative. This increased success in controlling illegal drug activity and in reducing the flow of IEs into the Tucson and Yuma Sectors would benefit all populations, regardless of income, nationality, or ethnicity. In addition, construction activities would have short-term, but positive impacts on local economies from sales of construction materials, other project expenditures, and temporary employment. Long-term positive impacts would occur on local, regional, and National levels by the reduction of IEs, and the associated social costs. Alternative 1 would provide the most opportunity to deter illegal traffic across the border, followed by Alternative 2 and then Alternative 3.

As mentioned previously, the expanded operations could indirectly result in higher housing demands and, in turn, increased housing costs. This could cause environmental justice concerns for both low income and minority populations where the increased demand in housing would further increase the cost of affordable housing. These impacts would probably be felt in areas where the average annual growth rate in housing prices is rising faster than the average annual growth rate in median household income. The BP is aware of this concern and is proactive in finding solutions. For example, CBP is proposing through the General Service Administration (GSA), to build 52 housing units near the Ajo Station and 15 units near the Lukeville POE. These housing units are to accommodate the increase housing demand anticipated by ultimately placing new agents in those areas (Parsons 2003 and Feeney 2003).

4.9.6 Executive Order 13045, Protection of Children

Executive Order 13045 of April 21, 1997, “Protection of Children from Environmental Health Risks and Safety Risks,” requires each Federal agency “to identify and assess environmental health risks and safety risks that may disproportionately affect children” and “ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks” (62 FR 19885). Implementation of any

alternative would not result in disproportionately high or adverse environmental health or safety impacts to children. The majority of the construction would take place away from residential areas and would ultimately result in a decrease of illegal traffic throughout the area, creating a safer environment for children. Furthermore, these alternatives would result in a reduction of illegal immigration, drug trafficking, and other crimes within the area further making a safer living environment for children. Projects near border towns would have the greatest potential to have health or safety impacts on children. Because of the relatively low population density within the project area, however, these issues are unlikely. The potential impacts to the health and safety of children for such projects would need to be evaluated on a case-by-case basis in future NEPA documentation tiered from this PEIS.

4.10 PUBLIC SERVICES AND UTILITIES

4.10.1 No Action Alternative

Implementation of the No Action Alternative would not affect current public services (*e.g.*, police, fire, and emergency medical services) and utilities within the Tucson and Yuma Sectors since no new construction would occur. At present, public agencies and private industry regularly perform maintenance of existing utilities within the region and are continuing to provide needed public services, such as law enforcement, medical treatment, and education. Therefore, these services would not change.

It should be noted that future impacts not associated with BP operations might occur regardless of the No Action Alternative since existing infrastructure of services and utilities would eventually be unable to meet the capacity requirements of the growing populations within these respective counties.

4.10.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

Implementation of Alternative 1 is expected to cause negligible disruption to current public services within the Tucson and Yuma Sectors, with the exception of some possible traffic delays in the vicinity of any construction adjacent to public roadways. Impacts to individual utilities would be evaluated on a site-specific basis following a utility survey of the respective areas to be affected in future action-specific NEPA documents. Some anticipated impacts include additional electrical and water usage, additional disposal of solid wastes, and additional need for

fire and emergency services and possible traffic delays around construction sites such as lighting projects or new stations. A proper traffic management plan implemented during the placement of proposed additional lighting and new stations would minimize any potential traffic delays caused by additional BP agents.

4.10.3 Alternative 2. Expand Technology-Based Systems and Approved Infrastructure

Implementation of Alternative 2 is also expected to cause only negligible disruptions to current public services within the Tucson and Yuma Sectors. As in the case of Alternative 1, the impacts to individual utilities would need to be evaluated on a site-specific basis following a utility survey of the respective areas to be affected in future action-specific NEPA documents.

4.10.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

This alternative would have the least direct impacts on public utilities, since only construction in support of increased operations would occur. A proper traffic management plan implemented during the placement of proposed additional lighting and new stations would minimize any potential delays. As in the case of Alternatives 1 and 2, the impacts to individual utilities would need to be evaluated on a site-specific basis following a utility survey of the respective areas to be affected in future action-specific NEPA documents. Operational activities would be expanded, but these are not expected to cause significant additional demands on or impacts to public utilities.

4.11 HAZARDOUS MATERIALS

4.11.1 No Action Alternative

Completion of all ongoing infrastructure projects is expected to result in a minimal increase in hazardous materials generated by BP operations. These materials include used oil generated from vehicles and other wastes. This increase in materials is expected to have a minimal impact since proper waste disposal practices are followed at BP facilities. This alternative would also insure that no known waste sites are impacted from construction activities. However, the potential for hazardous material spills from abandoned vehicles would persist and likely increase under this alternative. Hundreds of vehicles are abandoned by IEs throughout the study area. All of these vehicles carry hazardous substances such as oil, antifreeze, and gasoline. In some areas the amount of garbage and human waste from IEs is substantial

enough to be considered a hazardous waste site (Tibbitt 2004). These sites are potential health risk to workers and visitor to public lands.

4.11.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

The BP would perform site-specific environmental site assessments, as appropriate, within the study area, prior to implementation of construction projects. Prior to acquisition of additional lands required to implement any projects, environmental site assessments are also conducted. Because of the random nature of illegal dumping along the US-Mexico border, it is difficult to determine the location and quantity of hazardous waste that may be present in a proposed construction area. If hazardous materials or wastes were present, there would be a potential for exposure during construction activities. Construction personnel would be informed about the potential for encountering hazardous wastes that may be present on the site from dumping and the appropriate procedures to use if suspected hazardous contamination is encountered. Additionally, a SPCCP prepared by the BP would be in place prior to construction. All personnel would be briefed on the implementation and responsibilities of the plan. Alternative 1 would reduce illegal vehicle and foot traffic thus reducing the potential for hazardous materials to be introduced into the border area by IEs, thus having an indirect beneficial effect.

An accidental release or spill could occur as a result of fuels, oils, lubricants, and other hazardous or regulated materials brought on site for the proposed construction activities. Any uncontained and unremediated spill could result in potentially adverse impacts to on-site soils and threaten the health of the local population, as well as wildlife and vegetation. However, the BP site-specific SPCCP and commitment to have trained personnel and the proper equipment located on-site to quickly contain and remediate any accidental release or spill would limit the amount of fuel and other lubricants and oils released and aerial extent of impact. As a result, no significant impacts would be expected.

4.11.3 Alternative 2. Expand Technology-Based Systems and Approved Infrastructure

As discussed for Alternative 1, projects included under this alternative would have little or no affect on any known inactive or abandoned hazardous waste sites. Since this alternative would result in less construction particularly along roads for tactical checkpoints and station facility construction in the vicinity of the US-Mexico border, the probability of encountering hazardous waste sites would be slightly less than Alternative 1. This alternative would result in an increase

in waste oils generated by BP operations, primarily in the use of portable light generators. There would be no significant impacts since waste oil disposal is carefully managed in strict accordance with state and USEPA procedures and regulations.

This alternative would not deter illegal traffic to the extent of Alternative 1 and apprehensions would still occur north of the border. Therefore, this alternative would have indirect benefits similar to Alternative 1, but to a lesser degree.

4.11.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

The actions proposed under this alternative are expected to result in a minimal increase in waste materials generated by BP operations. These materials include used oil generated from vehicles, generators, and other equipment maintenance activities. This increase in materials is expected to have a minimal impact since wastes would be disposed of in strict accordance with state and USEPA procedures and regulations. This alternative would generate less waste than Alternatives 1 and 2. However, the indirect beneficial effects would be less compared to Alternative 1 because apprehensions would not occur in proximity to the border due to the lack of infrastructure. Without infrastructure to deter illegal entry, IEs will continue to enter the US illegally.

4.12 NOISE

4.12.1 No Action Alternative

The No Action Alternative would not result in any additional noise increases from construction and operational activities.

4.12.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

This alternative would result in construction and operation of new facilities, tactical checkpoints, roads, fences and barriers, helipads, lighting, and RVS systems along the Arizona border.

4.12.2.1 Construction Noise

Construction activities would temporarily increase noise levels at locations immediately adjacent to construction sites. Noise levels created by construction equipment would vary greatly depending on factors such as the type of equipment, specific model, operation being performed, and condition

of the equipment. The equivalent sound level (Leq) of the construction activity also depends on the fraction of time that the equipment is operated over the time period of the construction.

Construction equipment can be divided into two major groups: stationary and mobile. Stationary equipment operates in one location for one or more days at a time, with either a fixed power operation (pumps, generators, compressors) or a variable power operation (pile drivers, pavement breakers). Mobile equipment moves around the construction site with power applied in cyclic fashion (bulldozers, loaders) or to and from the site (trucks).

Depending on the scale and the type of project and stage of environmental review, the BP may conduct a construction noise assessment that would be incorporated into the environmental document for the project. When the project is major (*i.e.*, the construction duration is expected to last for more than several months), noisy equipment would be involved, or the construction is expected to take place near a noise-sensitive site (especially for residential and institutional uses), then detailed construction noise analyses may be required. Otherwise, the assessment would be a general description of the equipment to be used, duration of construction, and any mitigation requirements placed on particularly noisy operations. Most construction activities as the result of this alternative would produce only short-term noise level increases. Since construction would only occur during daylight hours and blasting would not be expected, these short-term noise increases are not expected to substantially affect adjacent noise sensitive receptors and wildlife areas.

If it is determined to be necessary, a detailed construction noise assessment can be performed to predict construction noise level using Federal Highway Administration (FHWA) methodologies or other prediction models. Noise impact will be assessed based on project-specific criteria, existing ambient noise level, duration of the construction activities, adjacent land uses, and proximity to sensitive receptors.

Construction noise can be controlled with appropriate mitigation measures. These mitigation measures include:

- Construction of temporary walls and/or earth berms;
- Providing equipment enclosures;
- Re-route truck traffic away from sensitive receptors;
- Minimizing nighttime construction activities;
- Avoiding impact pile driving if possible; and
- Using quieter equipment, such as enclosed air compressors and mufflers.

In addition, community relations would be important. The affected communities will be informed about the duration and extent of the construction activities through public service announcements via local media sources (*e.g.*, newspaper and radio).

4.12.2.2 Operational Noise

The BP operations associated with this alternative, such as the use of helicopters, airplanes, electric power generators and substations, would cause long-term short-duration increases in noise levels. The magnitude of these increases would depend upon ambient noise levels, distance to sensitive receptors, increase in number of such operational activities, and duration.

BP firing ranges would usually be located in rural areas away from the communities for safety reasons. Therefore, noise impacts from firing ranges would be minimal. However, site-specific NEPA analyses would be performed for such projects. Portable generators for lights would also be situated primarily in remote areas, where access to electrical power sources is not readily available, and thus, away from human sensitive noise receptors.

Vehicle, aircraft, and helicopter noise during the border patrol and reconnaissance operations will be mostly temporary in nature. However, long-term noise increases could occur around regional airfields and heliports if the number of daily flights is increased substantially (more than 10 percent of the total annual operation) and/or the helicopters are used frequently near noise sensitive locations. If it were determined to be necessary, the BP would conduct a detailed aircraft noise assessment to predict noise levels using Federal Aviation Administration (FAA) methodologies and prediction models, such as Integrated Noise Model (INM) and Helicopter Noise Model (HNM). Noise impacts will be assessed based on FAA and project specific criteria, existing ambient noise level, number of operations, flight path, and adjacent land uses.

In addition, the BP may be required to perform a detailed traffic noise assessment to predict noise levels using FHWA methodologies and prediction models. A Traffic Noise Model (TNM) will be required if there is substantial increase (more than 50 percent of the peak-hour volume) in vehicular traffic on existing and proposed roads near noise sensitive receptors. This is not expected to occur.

4.12.3 Alternative 2. Expand Technology-Based Systems and Approved Infrastructure

4.12.3.1Construction Noise

This alternative would only eliminate or reduce the amount of operation activities, such as installation of tactical checkpoints and station construction. Construction activities would consist of technology-based operational infrastructures and approved infrastructure projects. Therefore, it would experience similar construction noise impacts as Alternative 1.

4.12.3.2 Operational Noise

Air operations, training at firing ranges, and other operational-dependent activities would still occur under this alternative and produce noise. Typical noises resulting from normal operations would be reduced since operations would focus on remote detection rather than intense roving vehicle patrols. The magnitude of these effects would depend upon the variables described under Alternative 1. Operation of most technology-based systems (*e.g.*, RVS, ground sensors, stadium lights) would produce little or no noise. Portable generators for lights would increase ambient noise levels. Generators would be situated primarily in remote areas, where electrical power sources are not readily available and away from human sensitive noise receptors such as schools and hospitals.

4.12.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

4.12.4.1 Construction Noise

This alternative would greatly reduce construction noise compared to Alternatives 1 and 2. No infrastructure construction would take place under this Alternative. Increased operations and technology-based operations would be implemented and limited construction activities would be needed in support of those operations. Construction activity would be limited to RVS sites, stadium and portable lighting, BP stations, and temporary campsites.

4.12.4.2 Operational Noise

If implemented, this alternative would result in increased air operations, training at firing ranges, and other operational activities. These would produce additional noise. The magnitude of these effects would depend upon the variables described under Alternative 1.

Vehicle, aircraft, and helicopter noise during patrol and reconnaissance operations would be mostly temporary in nature. However, long-term noise increases could occur around regional airfields and heliports if the number of daily flights is increased substantially and/or the

helicopters are used frequently near noise sensitive locations. Target locations for increased noise are difficult to predict with certainty as is inherent with any type of law enforcement activity in hot pursuit.

4.13 AESTHETICS

4.13.1 No Action Alternative

Aesthetics is a subjective issue that varies by personal preference. With the No Action Alternative, impacts to aesthetics would continue to occur at the existing levels, as the current BP operational activities, technology-based systems and infrastructure would be maintained. Direct long-term impacts to aesthetics would likely increase from damage to natural resources (*i.e.*, illegal roads in sensitive and Wilderness Areas, garbage, etc.) as a result of increased illegal traffic and the required subsequent BP enforcement actions (see Figures 1-5 and 1-6). Illegal traffic has affected the wilderness characteristic of some Wilderness Areas to the point they would not longer be considered to have wilderness value (Tibbitt 2004).

4.13.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

Depending on the location of increased BP operations/activities, expansion of technology-based systems, and approved infrastructure, Alternative 1 would have both beneficial and negative effects on those areas valued for their aesthetic qualities, such as Wilderness Areas, national parks, wildlife refuges, etc. The expansion of BP operations/activities, technology-based systems, and approved infrastructure would have a potential negative effect on aesthetics. The majority of the approved infrastructure projects are located along the border in previously disturbed areas. It should be noted, enforcement actions would have an indirect positive effect on aesthetics as a result of decreasing damage (*i.e.*, illegal roads, footpaths, trash, defecation, etc.) caused by illegal traffic in those areas valued for their aesthetic qualities. Alternative 1 would allow the BP to apprehend IEs within closer proximity of the US-Mexico border, thus potentially limiting most of the perceived negative aesthetic effects to the immediate border area in the long-term. Potential effects to aesthetics would be addressed in site-specific project NEPA documents for future special operations and technology-based systems.

4.13.3 Alternative 2. Expand Technology-Based Systems and Approved Infrastructure

Depending on the location of technology-based systems and approved infrastructure, Alternative 2 would have both beneficial and negative effects on aesthetics. However, the effects would not be of the same magnitude as those expected under Alternative 1. Although the negative effects would be less under Alternative 2 because BP operations/activities would not be allowed to expand, the indirect beneficial effects would also be less because Alternative 2 would limit the BP's ability to apprehend IEs in closer proximity to the US-Mexico border. Thus, the footprint of illegal activity and subsequent BP enforcement activities would extend beyond the immediate border area.

4.13.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

The effects expected under Alternative 3 would be similar to Alternative 1.

4.14 RELATIONSHIP BETWEEN LOCAL AND SHORT-TERM USE OF SOCIETY'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM ENVIRONMENTAL PRODUCTIVITY

Benefits derived from the control of IEs and narcotics trafficking into the US and the adverse impacts associated with the expansion of BP operations and technology-based systems and completion of approved infrastructure necessary to accomplish this control represent trade-offs between the local, short-term use and the long-term stability and productivity of the environment. The proposed action would reduce the flow of illegal drugs and entrants to the US, and consequently, reduce the social costs associated with managing these issues. Short-term, local adverse direct effects resulting from habitat disturbances would be off-set by long-term regional benefits, including protection from illegal vehicle and foot traffic, accidental fires caused by IEs, lower costs to the country for health and emergency services, increase in the quality of life along the border, reduction in crime near the border, and reduction in poaching. Reductions in crime along the border would likely have a favorable effect on insurance rates for homeowners and businesses near the border.

The preferred alternative would require the conversion of approximately 587 acres. Most of this acreage has been previously disturbed and does not provide suitable habitat for most wildlife populations. The long-term productivity of these lands would be lost over the life of the proposed project. The CBP and BP would make every attempt practicable to avoid

disturbances to valuable wildlife habitat (*e.g.*, by locating project sites and staging areas in previously disturbed sites). Compensation for these losses, if statutorily required, would be coordinated through the appropriate state and Federal resource agencies, as described in Chapter 5. Some impacts to threatened or endangered species would occur and must be mitigated to offset these losses, as required by Sections 7 and 9 of the ESA.

4.15 IRREVERSIBLE AND IRRETERIEVABLE COMMITMENTS OF RESOURCES INVOLVED IN IMPLEMENTATION OF THE PREFERRED ACTION

The proposed action would result in the permanent conversion or loss of approximately 587 total acres of various habitats, mostly disturbed areas and non-native grasslands to roads and infrastructure. The proposed action would also require the irretrievable commitment of fuel, labor, vehicles, building materials, and monetary resources.

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SECTION 5.0
CUMULATIVE IMPACTS

5.0 CUMULATIVE IMPACTS

This section of the revised draft PEIS addresses the potential cumulative impacts associated with the implementation of the alternatives outlined in Section 2.0 and other projects/programs that are planned for the region. The following paragraphs present a general discussion of proposed and reasonably foreseeable CBP, BP, and other agency projects in southern Arizona and the cumulative effects that would be expected irrespective of the alternative selected. Reasonably foreseeable projects are those likely to occur within the next five years. These discussions are presented in the same sequential order as they appeared in Section 3 for each alternative carried forward for analysis. Transportation would not affect or be affected by the proposed alternatives and is excluded from the following discussion.

5.1 OTHER DHS/ CBP OPERATIONS

The BP is currently conducting projects in the region. Other recently completed or reasonably foreseeable BP projects in southern Arizona include:

- **Tucon Sector**:
    - Ajo Station:
        - Proposed housing developments within the Ajo Station's AO (52 unit housing development on 10 acres in Ajo and a 15 unit housing development at Lukeville, Arizona). The development will provide housing for approximately 225 agents and their families – GSA will contract the construction and CBP will lease housing from private entity (Parsons 2003);
        - Proposed lease/purchase/withdraw option of up to 35 acres of native desert habitat adjacent to the existing BP Station. The existing station land and proposed acquisition will be converted for proposed infrastructure (*e.g.*, garage, office space, etc.) requirements (Parsons 2003);
        - The BP proposes to lease an existing vehicle maintenance facility in Ajo, Arizona (Feeney 2003).
        - Potential addition of 2 camp details on the CPNWR within the Ajo Station's AO in support of ABCI;
        - Proposed installation of 12 RVS systems along the US-Mexico border south of Ajo, Arizona;
        - Installation of 6 emergency beacons within the CPNWR and Barry M. Goldwater Range (0.0012 acre);
        - Install a landing mat fence from the Lukeville POE extending 2 miles east and west (NPS 2003);
        - The BP proposes to construct a permanent vehicle barriers, an all-weather road and drag road along the CPNWR-Mexico border from the east boundary of the CPNWR to the Yuma/Pima County line;

- The BP proposes the installation of temporary vehicle barriers at Agua Dulce Pass, Davidson Canyon Road, and Papago Well Road within the CPNWR;
- Proposed maintenance of all existing roads and some administrative and illegal trails on the CPNWR;
- Proposed installation of two additional rescue beacons on the CPNWR; and
- Proposed installation of 11 RVS systems on the OPCNM and one RVS system in Ajo.

o Casa Grande Station:
- Improvements to about 52 miles of border road within the TON;
- Construction of a Joint Processing Center within the TON;
- Implementation of three tactical BP checkpoints on Federal and TON lands (DHS 2003c); and
- The BP proposes the construction of permanent vehicle barriers along the TON-Mexico border within the TON.

o Tucson Station:
- Proposed ½ to 1 acre parking area on vacant property near the intersection of Valencia and Randall Street in Tucson, AZ. The BP needs additional parking and proposes to clear, grade, and asphalt the site (Parsons 2003);
- Installation of three temporary camp details in the BP Yuma Sector, Wellton Station and the BP Tucson Sector, Tucson stations (approximately 1.5 acres) (INS 2002d);
- Proposed installation of 9 RVS systems along the US-Mexico border in or near the Coronado National Forest and Buenos Aires National Wildlife Refuge;
- Implementation of Operation Skywatch (a seasonal search and rescue mission using helicopters and fixed-wing aircraft) (INS 2002b); and
- Installation of 8 rescue beacons on the Federal and privately owned lands (DHS 2003e).

o Nogales Station:
- Acquisition of space for the Nogales Station;
- Restoration of Ephraim Ridge near Nogales (1.1 acres) (INS 2003c);
- Installation of 15 RVS systems in the Nogales Station's AO (INS 2003d);
- Installation of a relay tower at Crawford Hill (INS 2002h);
- Proposed installation of 87 miles of temporary vehicle barriers along the US-Mexico border in Pima, Santa Cruz, and Cochise counties, Arizona (DHS 2004d); and
- Relocation of checkpoint on I-19.

o Sonoita Station:
- Relocation of checkpoints (approximately 1 acre);
- Proposed improvement of 42 miles of existing trails/roads in the Sonoita Station's AO;
- Proposed establishment of three helicopter insert/extract sites within Miller Peak Wilderness (currently being coordinated with the Coronado National Forest);
- The Sonoita Station is currently proposing the establishment of two temporary camp details in the Huachuca and Patagonia mountains within the Coronado National Forest to potentially base horse patrol operations;

        - The Sonoita Station proposes to establish additional repeater sites in the Huachuca and Patagonia mountains and the Miller Peak Wilderness depending on operational necessities; and
        - Ten additional RVS sites are proposed.
    - Naco Station:
        - 30 to 50 portable lights in a 10.5 mile corridor near the Naco POE (approximately 0.5 acres) (INS 2001b);
        - Four miles of border road improvements and 9 miles of pedestrian fence construction west of Naco (approximately 10 acres) (INS 2003a);
        - Acquisition of hanger space at Sierra Vista;
        - Installation of nine RVS systems (INS 2003b); and
        - Cumulative EA for BP operations on Fort Huachuca.
    - Douglas Station:
        - Improvements to 2 miles of Kings Ranch Road to provide north/south access from the new Douglas Station to the border (approximately 9 acres) (INS 2002f);
        - A new BP station located about 2 miles west of Douglas (approximately 15 acres) (INS 2000b); and
        - The proposed installation of 13 RVS sites east of Douglas.
- **Yuma Sector:**
    - Yuma Station:
        - Proposed construction of approximately 13 miles of stadium style lights, 8 miles of secondary fence, 8 miles of all-weather patrol road, 8 miles of security fence, 8 miles of maintenance road, and approximately 3.5 miles of primary fence along the US-Mexico in the Yuma Station's AO;
        - Proposed construction of vehicle barriers along the US-Mexico border from Avenue C in Yuma, AZ to the Gila Mountains;
        - Construction of 40 RVS along approximately 45 miles of the US-Mexico border in the Yuma and Wellton stations; and
        - Conversion of the existing Yuma Station complex into a Sector training facility.
    - Wellton Station
        - Proposed construction of vehicle barriers along the US-Mexico border from the Yuma/Pima County line to the Gila Mountains;
        - The deployment of eight additional rescue beacons on the CPNWR and BMGR;
        - Potential addition of four temporary camp details for rapid deployment of a 21-foot travel trailer for a brief period of time on the CPNWR and BMGR;
        - Proposed use and maintenance of all existing roads and some administrative and illegal trails on the CPNWR and BMGR;
        - Proposed installation of a water well at the existing Desert Grip Camp;
        - Proposed construction of a new station headquarters;
        - Proposed creation of two drag roads on the BMGR;
          Proposed improvement of the El Camino Del Diablo Road to an all-weather road with an adjacent drag road from Papago Well to Tinajas Altas Pass;
        - Proposed continued maintenance, use, and improvements on the line drag road from International Boundary Monument 192 to Avenue 4E. Proposed improvements include grading and widening the road that runs through High Tank Pass;

- Proposed use of horses, ATVs and motorcycles on existing roads and foot trails on the CPNWR and BMGR; and
- Proposed intallation and use of additional radio repeater, microwave links, RVSs, sensors, and radar.

The BP might be required to implement other activities and operations that are currently not foreseen or mentioned in this document. These actions could be in response to national emergencies or security events like the terrorist attacks on September 11, 2001, or to changes in the mode of operations of the potential IEs. For instance, during the summers of 2002 and 2003, the Tucson Sector temporarily had to detail aircraft and support personnel from other Sectors to provide additional SAR missions. The sole purpose of these missions (known as Operation Skywatch) was to save the lives of IEs. Operation Skywatch temporarily assigns 20 helicopters and two fixed-wing aircraft, 24 pilots, up to 12 aircraft mechanics and other support personnel as needed to the Tucson Sector for a period of approximately 125 days. SAR aerial reconnaissance also indirectly benefits the natural environment by reducing the amount of off-road traffic required to rescue IEs. The BP has prepared an EA documenting the potential impacts from (INS 2002b). The Yuma Sector, on an as-needed basis, provides additional support.

The BP recently completed a Supplemental EA for the Expansion of Operation Desert Grip (DHS 2003b). This project temporarily details two trailers, eight agents, and six vehicles in two areas with high IE activity in a remote region of the desert in both the Tucson and Yuma Sectors. Trailers are located on previously disturbed areas. The purpose of this project is to provide a 24-hour presence along the border to deter IEs in an effort to save lives.

As part of the ABCI, UAVs, which currently under operational test, could be more widely used along the border in remote areas. The BP agents could potentially manage security of these remote areas more effectively and efficiently through prompt detection, interdiction, and apprehension of those who attempt to illegally enter or smuggle contraband or tools of terrorism across US borders.

Operation Skywatch, ABCI, and Operation Desert Grip received emergency consultation under Section 7 of the ESA. Operation Skywatch and Operation Desert Grip were addressed in the Tucson Sector draft BA (DHS 2004c) and the revised Yuma Sector BA (INS 2002c). Other major operations/actions would be evaluated as prescribed in the new DHS regulations (Management Directive 5100.1) to determine the need for and level of NEPA documentation.

The CBP is currently conducting projects in the region. Other recently completed or reasonably foreseeable CBP projects in southern Arizona include:

- A new Industrial POE at San Luis (approximately 15 acres) – As part of this project, there will be expansion construction at the current San Luis POE, and the cattle guard at the site of the new POE will be relocated to Avenue D (US Department of the Interior [USDOI] 2000);
- New Infrastructure at the Douglas – Agua Prieta crossing with a total of 11,526 square feet of office space, 40,680 square feet of light industrial space, 1,239 square feet health unit space, and 6,725 feet^2 of warehouse/storage space (CBP 2004);
- New Infrastructure at the Lukeville – Sonoyta crossing with a total of 13,690 square feet of office space, 13,259 square feet of light industrial space, 1,185 square feet health unit space, and 556 square feet of warehouse/storage space (CBP 2004);
- New Infrastructure at the Mariposa Road crossing with a total of 15,425 square feet of office space, 66,961 square feet of light industrial space, 264 square feet health unit space, and 283 square feet of warehouse/storage space (CBP 2004);
- New Infrastructure at the Morley Gate crossing with a total of 37,534 square feet of office space, 33,416 square feet of light industrial space, 1508 square feet health unit space, and 1803 square feet of warehouse/storage space (CBP 2004);
- New Infrastructure in Naco with a total of 8,461 square feet of office space, 7,516 square feet of light industrial space, 992 square feet health unit space, and 542 square feet of warehouse/storage space (CBP 2004);
- New Infrastructure at the San Luis crossing with a total of 13,286 square feet of office space, 24,834 square feet of light industrial space, 356 square feet health unit space, and 769 square feet of warehouse/storage space (CBP 2004);
- New Infrastructure at the Sasabe crossing with a total of 1,155 square feet of office space, 11,459 square feet of light industrial space, and 484 feet^2 of warehouse/storage space (CBP 2004); and
- The CBP is currently preparing a Programmatic Environmental Assessment for Office of Border Patrol actions on Fort Huachuca.

5.2 OTHER AGENCY PROJECTS

Plans by other agencies which would also affect the region's natural and human environment include various road improvements by ADOT, an US Highway 80 commercial truck bypass and border crossings near Douglas, a bypass highway near Yuma that will traverse the BMGR, the Bisbee-Douglas International Airport expansion, and the reactivation of the abandoned Southern Pacific railroad line. With the exception of the proposed new bypasses and border crossing near Douglas, the remaining projects would be along existing corridors and/or within previously disturbed sites (*e.g.*, airport). Land use would change along the bypass, and additional wildlife habitat would be lost. The magnitude of these effects would depend upon the length and width of the bypass ROW and the extant conditions within and adjacent to the ROW. Reactivation of the railroad line and crossing near Naco would result in additional habitat losses, even though the rail would probably be constructed along the existing, but abandoned, line.

The tracks were removed in 1975 and have had ample time for vegetation to recover. Reactivation of the line would also increase noise in the immediate vicinity and increase potential health and safety risks due to possible transportation of hazardous cargo.

In addition, projects are currently being planned which could affect areas currently in use by the BP. The CBP and BP would maintain close coordination with these agencies to ensure that their activities do not conflict with other agency(s) policies or management plans. The BP will consult with applicable state and Federal agencies prior to performing any construction activities and will coordinate operations so that it does not impact the mission of other agencies. The following is a list of projects other applicable agencies are conducting within the US-Mexico border region.

- The BLM is currently in the process of producing Resources Management Plans (RMP) for the Sonoran Desert National Monument and an EIS for implementation of the RMP. The RMP addresses the management of public lands in the Sonoran Desert. The plan could propose the closure and reclamation of some roads currently traveled by BP agents.
- The USAF and USMC are also in the process of producing an INRMP for the BMGR and a draft EIS for implementation of the INRMP on BMGR. This plan, if implemented, could also change the areas available for certain BP operations/activities.
- The BLM is currently preparing the Ironwood Forest National Monument INRMP.
- The BLM recently approved (July 25, 2003) a Resource Management Plan (RMP) for BLM's Las Cienegas National Conservation Area (NCA). The approved RMP and Record of Decision (ROD) establish land use decisions and management actions for the 42,000-acre NCA.
- The NPS is in the process of preparing a Wilderness Management Plan for the Wilderness Areas located within the OPCNM.
- The NPS is to complete the construction of approximately 30 miles of vehicle barriers along the US-Mexico border within the OPCN and a 1-mile section in the Coronado National Memorial. Construction should begin in 2003 (NPS 2003).
- The NPS is preparing an Environmental Assessment for BP actions, including actions in support of the ABCI, on the OPCNM.
- The USFS is in the process of planning Pena Blanca Lake Maintenance in Santa Cruz County.
- The USFS is planning border road maintenance in San Rafael Valley, Santa Cruz County.
- The USFS is planning Chiminea pasture division and Montana grazing allotment in the Pajarita Mountains, Santa Cruz County.
- The USFS is proposing a fuels treatment in Hunter Canyon on the Sierra Vista Ranger District.
- The USFS is proposing dam maintenance project in Canelo Hills, Cochise County
- The USFS is planning Potrero fuelwood/hazardous fuel reduction in the Pajarita Mountains, Santa Cruz County.
- The USFS is planning the Puerto Spring enclosure in the Tumacacori Mountains, Santa Cruz County.
- The USFS is planning renovations on the Rose Canyon Campground (T 12 S, R 16 E, Section 16) in Pima County.

- The USFS is proposing a renovation project at Sabino Recreation Site (T 13 S, R 15 E, Section 9) Pima County.
- The USFS is planning to use spruce MCH in the Pinaleno Mountains, Graham County.
- The USFS is planning the A-Bar Habitat Improvement project in the Patagonia Mountains, Santa Cruz County.
- The USFS is planning the American Flag/Interocean Allotment Management Plan in T 10 S, and T 11 S, R 16 E, Pinal and Pima Counties.
- The USFS is planning the Bear Valley Allotment Management Plan in the Pajarito Mountains, Santa Cruz County.
- The USFS is planning the Bug Springs Trail Designation and Construction in T 12 S, R 6 E, Sections 22, 27, 28, and 33 on the Santa Catalina Ranger District.
- The USFS is planning the Carr (Grab) Small Tracts Act in the Huachuca Mountains, Cochise County.
- The USFS is planning the Carr House parking lot and restroom facility in the Huachuca Mountains, Cochise County.
- The USFS is planning bunkhouse construction at the Columbine Work Center in the Pinaleno Mountains, Graham County.
- The USFS Coronado National Forest is planning a forestwide Invasive Exotic Plant Management Program.
- The USFS Cote Land Exchange project is currently on hold in the Sierra Vista Ranger District.
- The USFS is planning the Duquesne, Hayfield, Lochiel, Blacktail Allotment Management Plans in the Huachuca Mountains, Santa Cruz County.
- The USFS is planning the Ferrell, Harshaw, MacFarland, Lewis, Weiland, Red Mountain Allotment Management Plans in Santa Cruz County.
- The USFS is planning the Granillo Small Tracts Act in the Huachuca Mountains, Cochise County.
- The USFS is planning a relocation project for Greaterville Road in the Santa Rita Mountains, Pima County.
- The USFS is proposing the Happy Valley Allotment Management Plan in the south end of the Rincon Mountains, T 15 S, R 18 E, Pima and Cochise Counties.
- The USFS is planning the Horseshoe, Cienega, Sanford, Sulphur Draw Allotment Management Plans in the Chiricahua Mountains, Cochise County.
- The USFS is proposing the Jakes, Laurel Canyon, Kane Springs, North and South Reef, and Goodwin Allotment Management Plans in the Santa Teresa Mountains.
- The USFS is planning a pipeline extension along the Jones Mesa in the San Rafael Valley, Santa Cruz County.
- The USFS is planning the Kent Springs Center Permit in Madera Canyon of the Santa Rita Mountains, Santa Cruz County.
- The USFS is planning the Dunde and Papago Allotment Management Plans in the Canelo Hills, Santa Cruz County.
- The USFS is planning the Lone Mountain Land Exchange in the Huachuca Mountains, Cochise County.
- The USFS is planning the Maderia Canyon Association Waterline in the Santa Rita Mountains, Pima and Santa Cruz Counties.
- The USFS is planning mechanical brush control in San Rafael Valley, Santa Cruz County.
- The USFS is planning a burn in Merritt Canyon in the Huachuca Mountains, Cochise County.
- The USFS Forest Plan Amendment for Mexican Spotted Owl and Northern Goshawk management within the wildland-urban interface is currently on hold in the Supervisor's Office.

- The USFS is planning the Outfitter/Guide Ranger District and Forest Wide 5 Year permit issuance in the Sierra Vista Ranger District.
- The USFS is planning the Paradise Allotment Management Plan in the Ciricahua Mountains.
- The USFS is planning the Peloncillo Mountains Programmatic Fire Plan in Cochise County, Arizona and Hidalgo, New Mexico.
- The USFS is planning the Perimeter Trail and Parking Plan in the Huachuca Mountains, Cochise County.
- The USFS is planning the Pine Canyon Camp Master Development Plan in Pine Canyon, Chiricahua Mountains, Cochise County.
- The USFS is proposing the Red Mountain Powerline project in the Patagonia Mountains, Santa Cruz County.
- The USFS is planning the Redington Pass Area Analysis (T 13 S, R 16 and 17 E) in Pima County.
- The USFS is proposing the Rose Canyon Fuels Reduction project (T 12 S, R 16 E, Section 16 in Pima County.
- The USFS is planning the Sabino Historic Trail Designation (T 13 S, R 15 E, Section 2) in Pima County.
- The USFS is planning a prescribed burn project for Stockton in the Pinaleno Mountains, Graham County.
- The USFS is planning a Tiger Salamander habitat improvement project in the Huachuca Mountains, Cochise County.
- The USFS is planning the Twilight Dispersed Recreation Area in the Pinaleno Mountains, Graham County.
- The USFS is planning the University of Arizona Florida Work Center permit in the Santa Rita Mountains, Pima County.
- The USFS is planning a Wildland Fire Amendment to the Coronado National Forest Land and Resource Management Plan.
- The USFS is planning a project for the Alpha Calcit marble Quarry in the Dragoon Mountains, Cochise County.
- The USFS is proposing a project concerning the PNM Transmission Line from Palo Verde Power Plant, AZ to Nogales, Sonora, Mexico.
- The USFS is planning a project regarding the TEP Transmission Line from Sahuarita, AZ to Nogales, Sonora, Mexico.

The City of Nogales is the designated gateway from and to Mexico on the CANAMEX Trade Corridor. The name “CANAMEX” is derived from the country names of Canada, America, and Mexico where a western trade corridor of existing 1,700 miles of highway and interstate systems connect the three countries. The CANAMEX corridor is poised to become one of the most important north/south trade corridors in North America, as well as a catalyst for economic growth and development in the CANAMEX region.

The United States 1998 Transportation Equity Act for the 21st Century (TEA-21)(P.L. 105-178) allocated $140 million per year for planning, engineering, design, and construction of high priority corridors and border crossings for the subsequent five years. The state governments of

Arizona and Nevada committed to obtain funds to construct a four-lane divided highway in anticipation of the CANAMEX Trade Corridor. The completion of these projects would create an uninterrupted north/south highway system down the spine of the CANAMEX Trade Corridor. This project is in the planning stage, and potential impacts are unknown at this time.

5.3 CUMULATIVE ENVIRONMENTAL EFFECTS

The CEQ defines a cumulative impact as an impact on the environment, which results from the incremental impact of multiple past, present, and future actions with individually minor but collectively significant effects (See 40 C.F.R. §1508.7). A cumulative impact can be concisely defined as the total effect of multiple land uses and developments, including their interrelationships, on the environment, including cultural and socioeconomic resources.

Past NEPA documents have evaluated and recorded cumulative effects of the BP operations/activities and infrastructure projects for the southwest border region. These included, but were not limited to, EAs from previous and current CBP and JTF NORTH projects, a Programmatic Environmental Impact Statement (USACE 1994), the EA for INS infrastructure within the Naco-Douglas Corridor (INS 2000a), the Environmental Assessment for Operation Skywatch for Tucson Sector, Arizona (INS 2002b), the Environmental Assessment for Operation Desert Grip within the Tucson and Yuma Sectors, Arizona (INS 2002e), and the Supplemental Programmatic Environmental Impact Statement for INS and Joint Task Force-Six Activities (USACE 2001). Many positive cumulative impacts have been realized through BP activities. For example, construction and maintenance activities have had cumulative positive impacts on socioeconomic resources within the border area and the Nation through reductions in illegal drug smuggling activities. The former INS (now CBP) activities completed from 1994 to 1999 have provided information on over 100 new cultural resources potentially eligible for NRHP listing.

Other agency plans and actions in the region, which could also affect the region's natural and human environment, were compiled and reviewed to evaluate cumulative effects (Section 5.2). The following sections quantify, where possible, cumulative impacts as a result of the past and proposed CBP activities and identify potential cumulative effects of other agency plans and actions in the region. Tables 4-1 and 4-2, presented previously, provide the basis for quantification of past and proposed CBP activities within the Tucson and Yuma Sectors. The

total CBP acreage impact estimate for each resource was derived from Tables 4-1 and 4-2. For certain resources, such as water quality, it is impossible to quantify and distinguish cumulative impacts by alternative, so a qualitative discussion of effects is included. Future site-specific NEPA documents, tiered from this PEIS, will quantify potential cumulative impacts of each site-specific action and its alternatives.

5.3.1 Soils

Ongoing CBP infrastructure and operations have required some form of ground disturbance of native soil. Soils that are denuded are vulnerable to erosion. The proposed BP infrastructure and operations are not expected to produce significant cumulative adverse impacts on soils in the study area because appropriate environmental design and mitigation measures will be implemented to prevent soil erosion. Furthermore, erosion has been alleviated on hundreds of miles of road through ongoing actions such as improved drainage crossings (*e.g.,* culverts, gabions, and other low water crossings) and erosion control measures (*e.g.,* water bars, mats, straw bales, and re-seeding). Erosion control is an important planning element of approved actions. In addition, fences have precluded illegal foot and vehicular traffic that, in turn, disturb soils (USACE 2001). There are soil disturbance activities (*e.g.* drag-roads) that are inherent with ongoing and approved CBP actions that will yield minor adverse secondary effects. However, the vast majority of impacts associated with approved projects are from road maintenance and improvement projects planned to alleviate soil erosion; thus, the cumulative effects on soils would be beneficial.

5.3.1.1 No Action Alternative

The No Action Alternative would have the fewest direct cumulative impact on soils as only the ongoing CBP infrastructure and operations would be continued. The No Action Alternative does have a cumulative direct impact as ongoing actions have subjected an estimated 6,508 acres (10 square miles) of native soil to some form of ground disturbance. In addition, the No Action Alternative could yield potential indirect impacts to soils as existing and future erosion problem areas potentially repaired by CBP actions would be obviated. IE activity in the border region would continue to disturb soils through the creation of trails and the disturbance of high erosion areas such as arroyos and washes. Furthermore, reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 will likely have adverse cumulative effects on soils in the region.

5.3.1.2 Alternative 1: Expand Operations, Technology-Based Systems, and Approved Infrastructure

Alternative 1 would impact about 587 additional acres (0.9 square miles) of soils by approved projects that require some form of ground disturbing construction. The cumulative soil disturbance impact of ongoing and approved CBP operations and infrastructure total approximately 10,598 acres (16 square miles). In addition to the estimated impact of approved CBP operations and infrastructure, the reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 would have significant cumulative effects on soils in the region.

Beneficial cumulative impacts of Alternative 1 would include the reduction of off-road vehicle and foot traffic by both IEs and BP agents. Expansion of operations, implementation of technology-based systems, and improved infrastructure would all contribute to more efficient and effective apprension of IEs and both concentrate and control disturbance-causing activities of IEs and BP. While the expansion of operations would result in an initial increase of the operation footprint, the resulting improvement in apprehension rates and numbers and the potential for eventual deterrence of IEs would reduce long-term impacts to soils. The implementation of technology-based systems would have indirect benefits to soils through the reduction of the number of agents in the field, potential deterrence of IEs crossing the border, and improved efficiency of IE apprehension. Although improvements to infrastructure would result in an initial disturbance and loss of soils, improved access to the border, improved road conditions, and the potential reduction of IE activity would reduce the overall effect of erosion and soil loss. The three measures proposed under Alternative 1, when implemented together, would act synergistically to reduce ongoing soil disturbance.

5.3.1.3 Alternative 2: Expand Technology-Based Systems and Approved Infrastructure

Alternative 2 would disturb approximately 587 acres (0.9 square miles) of soil due to the expansion of infrastructure and technology-based systems operation. The cumulative soil disturbance impact of Alternative 2 totals approximately 10,598 acres (16 square miles). Under Alternative 2, the extent of operations would remain unchanged. Thus, indirect impacts from potential off-road activities of Alternative 2 would be less than those expected under Alternative 1. However, the areas into which the BP proposes to expand their operations would continue to be opportunistic areas for IEs to avoid apprehension. Soil disturbances in these areas would be likely to increase as IEs learn to utilize under-patrolled areas. In addition to the estimated

impact of approved CBP technology-based operations and infrastructure, the reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 will have cumulative effects on soils in the region. The indirect beneficial effects of Alternative 2 would be less than those of Alternative 1. Without the expansion of operations, areas of the border region would remain porous, resulting in reduced apprehension rates and efficiency.

5.3.1.4 Alternative 3: Expansion of Existing Operations and Technology-Based Systems

Alternative 3, the expansion of on going and approved operations without infrastructure improvements, would have the least cumulative direct impact on soils by disturbing approximately an additional 2 acres (cumulative impact of 10,013 acres [16 square miles]). However, reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 will have additive cumulative effects on soils in the region. The indirect impacts of increased operations and associated potential for increased off-road activities would be similar to those discussed under Alternative 1. The indirect beneficial effects of Alternative 3 would be less than those of Alternative 1 and similar in extent to those of Alternative 2. Without the expansion of infrastructure, BP operational resources would not be as effective or efficient in the apprehension and deterrence of IEs.

5.3.2 Vegetation Communities

The primary cumulative effect of the past and proposed projects is the permanent loss of vegetation. Throughout the Tucson and Yuma Sectors' AOs, native vegetation, consisting of mostly disturbed habitat, semi-desert grassland, and desert scrub communities, has been impacted by ongoing CBP infrastructure and operations and activities. In addition, vegetation communities have been indirectly impacted by increased illumination associated with stadium-style and portable lights.

5.3.2.1 No Action Alternative

The No Action Alternative would have the least direct impacts to vegetation communities as only the ongoing CBP operations would be continued and all construction (except stations) would cease. The No Action Alternative does have a cumulative direct impact as ongoing actions have subjected an estimated 11,901 acres (18 square miles) of direct impact and approximately 1,890 acres (3 square miles) of indirect impacts by increased illumination. In addition, reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 would likely have adverse cumulative effects on vegetation communities in the region. Indirect

effects from illegal traffic would likely increase above current levels as a result of not expanding BP operations, technology-based systems, and approved infrastructure. Impacts from illegal traffic have had an adverse significant impact on vegetation.

5.3.2.2 Alternative 1: Expand Operations, Technology-Based Systems, and Approved Infrastructure

Approximately 587 acres (0.9 square miles) of vegetation would be directly impacted by approved operations, technology, and infrastructure construction and approximately 430 acres (0.7 square miles) by increased illumination under Alternative 1. The expansion of operations would increase the operational footprint and the area of potential impacts to vegetation from off-road activities and disturbance in sensitive areas such as arroyos and washes. Much of the area of proposed infrastructure construction has been previously disturbed (*e.g.*, existing roads) or is naturally devoid of vegetation and would occur within 500 feet of the international border. In addition, impacts from roads and fences are calculated separately, when, in reality, this infrastructure would typically be constructed within the same footprint. Also, other reasonably foreseen CBP and other agency projects will have a cumulative impact on and further reduce vegetation and wildlife habitat.

The cumulative impact to vegetation of ongoing and approved CBP operations, technology and infrastructure construction totals approximately 10,598 acres (16 square miles) of direct physical impact and 2,320 acres (4 square miles) of illumination. In addition to the estimated impact of approved CBP operations and infrastructure, the reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 would have significant cumulative long-term effectson vegetation in the region.

The beneficial cumulative impacts of Alternative 1 would include the long-term reduction of off-road vehicle and foot traffic by both IEs and BP agents. The proposed improvements would give BP agents improved access to the border, the ability to apprehend IEs more quickly and closer to the border, and reduce the frequency of off-road vehicular and foot traffic. Reduction in off-road foot and vehicular traffic would significantly alleviate loss of vegetative cover causing erosion and compaction.

5.3.2.3 Alternative 2: Expand Technology-Based Systems and Approved Infrastructure

About 587 acres (0.9 square miles) of vegetation would be directly impacted by approved infrastructure and operation construction and approximately 430 acres (0.7 square miles) indirectly impacted by increased illumination under Alternative 2. It should be emphasized again, that these figures are estimates. Much of the area to be impacted has been previously disturbed (*e.g.*, existing roads) or is naturally void of vegetation. The direct cumulative impacts to vegetation would be very similar to Alternative 1. The short-term indirect impacts of Alternative 2 would be less than Alternative 1 and the long-term indirect cumulative impacts would be more than Alternative 1.

The cumulative impact to vegetation of Alternative 2 totals approximately 10,598 acres (16 square miles) of direct physical impact and approximately 2,320 acres (4 square miles) of illumination. In addition to the estimated impact of approved CBP operations and infrastructure, the reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 would have additive cumulative effects on vegetation in the region.

5.3.2.4 Alternative 3: Expansion of Existing Operations and Technology-Based Systems

Alternative 3, the expansion of on-going and approved operations without infrastructure improvements, would have the least additional impacts to vegetation. Approximately 2 acres of vegetation would be directly impacted under Alternative 3. There would be no additional impacts associated with illumination under Alternative 3. The cumulative impact to vegetation of Alternative 3 totals approximately 10,013 acres (16 square miles) of direct physical impact and 1,890 acres (3 square miles) of illumination. The indirect impacts from expanded operations would be the same as Alternative 1. In addition, reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 would have additive cumulative effects on vegetation communities in the region.

5.3.3 Fish and Wildlife Resources

The primary impact to fish and wildlife resources associated with ongoing CBP infrastructure and operations is the loss or conversion and fragmentation of habitat. Ongoing CBP infrastructure and operations have required some form of habitat conversion. The majority of this area is comprised of disturbed habitat, semi-desert grassland, and desert scrub communities. The approved BP infrastructure and operations are expected to produce significant cumulative adverse impacts to wildlife.

5.3.3.1 No Action Alternative

The No Action Alternative would have the least direct impact on fish and wildlife resources as only ongoing CBP infrastructure and operations would be continued. In addition, reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 will have additive adverse effects on fish and wildlife resources of the region.

5.3.3.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

Long-term indirect adverse cumulative effects to fish and wildlife resources have occurred and would continue to occur. However, these effects, both beneficial and adverse, are difficult, if not impossible, to quantify with the exception of conversion of habitat. Approximately 1,017 acres (1.5 square miles) of wildlife habitat would be directly impacted by Alternative 1 (587 acres directly impacted by approved infrastructure and operation construction and approximately 430 acres indirectly impacted by increased illumination). The fragmentation of large, continuous blocks of available habitat resulting from CBP, IE, ADOT, and USFS road and trail construction would also increase and continue to affect large species, species with large home ranges, and species dependent upon the conditions found in interior habitats or that are sensitive to the conditions created by edges. The cumulative impact to wildlife habitat of ongoing and approved CBP operations and infrastructure totals approximately 12,918 acres (20 square miles [10,598 acres of direct physical impact and 2,320 acres of illumination]).

Reductions in and fragmentation of habitat have undoubtedly created inter- and intra-species competition for available food and shelter. The effects associated with habitat fragmentation would continue. Increased patrol activities would increase the potential for some wildlife specimens to be accidentally hit and killed. Such losses would not be expected to result in significant reductions to the populations.

The area of CBP operations would be increased under Alternative 1 and would result in cumulative impacts to fish and wildlife resources. Some wildlife species are sensitive to anthropogenic activity and the increase in CBP operational area could result in the displacement or avoidance of some areas by these species. Increased operational area also increases the potential loss of individuals through incidental take. The beneficial effects of increased operational area would include the decrease of IE disturbance in the long-term.

The increase in lighting along the border also could produce some long-term cumulative effects, although the magnitude of these effects in some areas is not presently known. Some species, such as insectivorous bats, may benefit from the concentration of insects that would be attracted to the lights. Circadian rhythms of other diurnal species and migratory bird species; however, could be disturbed enough that breeding or feeding patterns are skewed, causing synergistic physiological changes. Most lighting would be placed near urban areas, thus reducing the chances of indirect effects, if any, on wildlife populations.

Consideration was given to the potential increase of raptor electrocution or entanglement in overhead power lines from the installation of stadium-style lights and RVS sites. Although injuries and deaths to raptors due to collision with power lines and support (guy) wires do occur, studies have indicated these structures do not present a major problem. The relative infrequency of collisions is due to the high visual acuity of raptors and the large size of transmission line conductors (Raptor Research Foundation 1996). The proposed RVS systems would also comply with USFWS guidelines for reducing fatal bird strikes on communication towers (see http://migratorybirds.fws.gov/ issues/towers/comtow.html [USFWS 2002]). These guidelines recommend co-locating new antennae arrays on existing towers whenever possible and to build towers as short as possible without guy wires or lighting and use white strobe lights whenever lights are necessary for aviation safety. In addition, most RVS towers are less than 200 feet high and, thus do not typically require guy wires. The stadium style lights and RVS towers do provide artificial perch sites for raptors. Consequently, raptor predation on small mammals, birds, reptiles, and other prey species are likely to increase in the study area.

5.3.3.3 Alternative 2. Expand Technology-Based Systems and Approved Infrstructure

The cumulative impacts on fish and wildlife resources would be very similar to Alternative 1. Approximately 1,017 acres (1.5 square miles) of wildlife habitat would be impacted by Alternative 1 (587 acres [0.9 square miles] directly impacted by approved infrastructure and operation construction and 430 acres [0.7 square miles] by increased illumination). The cumulative impact to wildlife habitat of ongoing and approved CBP operations and infrastructure totals approximately 12,918 acres (20 square miles [10,598 acres of direct physical impact and 2,320 acres of illumination]).

In addition to the estimated impact of CBP technology based operations and infrastructure, the reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 will have additive cumulative effects on wildlife resources in the region.

5.3.3.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

The cumulative impacts on wildlife would be lower in comparison to Alternatives 1 and 2. Approximately 2 acres (0.003 square miles) of wildlife habitat would be impacted by Alternative 3. The cumulative impact to wildlife habitat of ongoing and approved CBP operations and infrastructure totals approximately 11,903 acres (18 square miles [10,013 acres of direct physical impact and approximately 1,890 acres of illumination]). The cumulative effect of expanded operations on fish and wildlife would be similar to those discussed for Alternative 1.

In addition to the estimated impact of CBP technology based operations and infrastructure, the reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 would have cumulative effects on wildlife resources in the region.

The expansion of BP operations, especially off-road enforcement activities, would have a cumulative adverse impact to fish and wildlife resources. Expanded BP operations would adversely affect wildlife habitats and could result in the displacement of wildlife species. The beneficial effects of increased operational area would include the decrease of IE disturbance.

5.3.4 Threatened/Endangered Species and Critical Habitats

Ongoing and approved CBP operations/actions likely will have cumulative indirect effects on some threatened and endangered species and their habitat. For example, the Sonoran pronghorn is fairly timid and typically occupies remote areas away from human disturbance. Certain increased CBP operations (*e.g.*, expansion and increased use of patrol roads, helicopter patrols, etc.) may adversely affect the Sonoran pronghorn.

Beneficial effects on protected species have resulted from BP actions through habitat protection and enhancement as well as expanding the knowledge of species distribution and habitat suitability (Ervin 1998; Ellingwood and Schoch 1998). For example, the Yuma Sector routinely assists the AGFD and USFWS by providing helicopter reconnaissance during inventories of Sonoran pronghorn. The BP provided funding ($25,000) in 2002 for Sonoran pronghorn management (*e.g.*, placement and monitoring of temporary waters for the Sonoran pronghorn on the CPNWR and adjacent Federal land) and funding ($25,000) for the quantification and

monitoring of resource damage from past, current, and future IE activities and responses to those actions by Federal law enforcement entities. This funding was provided as partial mitigation for Operation Desert Grip (DHS 2003b).

It also appears that Sonoran pronghorn tend to utilize the BP drag roads for resting and foraging areas, presumably since the dragging activities indirectly (by changing local hydrology) encourage new forb (non-grasslike herbaceous plant) growth in adjacent areas (Hervert 1999a). It should be noted that because of the slow speed at which roads are dragged, it is highly unlikely that collisions with animals ever occur. To date, no such incidents have occurred. In addition, improvements to roads allow the BP to conduct patrol activities more effectively, significantly curtailing the amount of illegal traffic that is occurring in this area. IEs have caused a great deal of damage to native vegetation (much of which is contained within Wilderness Areas, areas of critical environmental concern (ACEC), or areas of designated critical habitat) by depositing trash, defecating, and by repeated trampling, burning, and cutting of native vegetation.

Quantification of potential future direct impacts on threatened and endangered species cannot be accurately predicted and distinguished by alternative. In order to determine those impacts, professional biologists must survey any proposed and alternate routes and/or locations in order to identify areas that may support protected species. For major construction projects, where protected species are known or presumed to occur, BP would use biologists to monitor construction progress and conduct post project long-term monitoring, as deemed necessary. Such assessments would be coordinated with the USFWS and other appropriate Federal and state resource agencies.

No significant variations in potential cumulative impacts on threatened and endangered species are anticipated with Alternatives 1, 2, and 3. The reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 could potentially have cumulative adverse effects to threatened/endangered species and critical habitats. Future site-specific NEPA documents, tiered from this PEIS, will quantify potential cumulative impacts on threatened and endangered species.

5.3.5 Unique and Environmentally Sensitive Areas

BP operations have occurred in unique and sensitive areas such as National Parks and National Wildlife Refuges. The BP is authorized and mandated by the Congress to enter any lands within 25 miles of the border during the pursuit of IEs. Consequently, when IEs attempt to enter the US through these sensitive areas, BP agents must attempt to apprehend them. Close coordination and approval from the appropriate Federal and state agencies would continue to be required for any construction activity potentially affecting any unique or sensitive areas (*i.e.,* Wilderness Areas, conservation areas, national parks, etc.) to ensure adverse effects would be avoided or substantially reduced. Roads and fences have and can deter illegal foot and vehicular traffic through environmentally sensitive areas. However, in some instances, roads and fences have caused obstacles such that IEs have relocated attempted crossings to sensitive remote areas (USACE 2001). The expansion of operations into unique and sensitive areas would have a significant short-term adverse impact on the quality and function of unique and sensitive areas. However, the expansion of BP operations could have long-term beneficial impacts, as the presence of and disturbance related to IEs is reduced.

5.3.6 Water Resources

5.3.6.1 No Action Alternative

The No Action Alternative would have the least direct cumulative impact on water resources as only the ongoing CBP infrastructure and operations would be continued. In addition, the No Action Alternative could yield potential indirect impacts to water quality erosion problem areas are exacerbated by the lace of repair and maintenance. Under the No Action Alternative, the BP's IE apprehension efficiency would remain unimproved, and IEs activities would continue to disturb water resources. Furthermore, reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 will likely have adverse cumulative effects to water resources of the region. Illegal traffic would continue and likely increase, thus resulting in additional roads and trails. Erosion from illegal roads and trails would have indirect long-term cumulative impacts on water quality.

5.3.6.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

Surface and groundwater supplies would be impacted for a short term during and immediately after completion of infrastructure construction projects. Construction of proposed BP infrastructure may require installation of water wells for water supply. Depending upon the

magnitude of increases in BP agents and the length of time required for construction projects, the additional demands on groundwater supplies could potentially have a direct and indirect adverse cumulative effects on the region's surface and groundwater systems, especially when combined with other urban development. The region's expanding water conservation measures would need to be incorporated into BP projects and operations to mitigate these effects. A reduction in erosion rates would have consequent beneficial results to area surface water quality by reducing turbidity and biochemical oxygen demands.

According to the 2001 JTF-6 Final Programmatic Environmental Impact Statement (USACE 2001), the total amount of waters of the US including wetlands that have been impacted by the legacy INS and/or JTF NORTH since 1994 has been less than five acres. Impacts to these valuable habitats have been avoided, wherever practicable, resulting in the low area impacted. Each project that cannot avoid effects on waters of the US including wetlands, however, is coordinated through the Section 404/401 permit process under the CWA with the appropriate regulatory agencies. The completion of on-going and approved infrastructure would affect up to 13.6 acres of other waters of the US, including wetlands (CBP 2003).

Unavoidable impacts associated with ground-disturbing infrastructure and technology-based systems have been or would be mitigated. The expansion of operation would include increased numbers of personnel and result in increased demand for water resources and could potentially increase erosion and pollution of stream channels and streams. Increased BP operations, especially off-road enforcement actions, could increase erosion, thus adversely impacting streams in the study area. However, the expansion of operations would have an indirect long-term beneficial impact as a result of reducing illegal traffic and erosion resulting from illegal traffic.

5.3.6.3 Alternative 2. Expand Technology-Based Systems and Approved Infrstructure

The direct cumulative impacts to surface water quality and groundwater supply would be very similar to Alternative 1. Alternative 2 would directly impact 587 acres (0.9 square miles) of land surface area as a result of completing approved infrastructure. However, cumulative impacts would be less than Alternative 1 with the deletion of expanded operations. In addition to the estimated impact of CBP technology-based operations and infrastructure, the reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 could have cumulative adverse effects on surface water quality and groundwater supply in the region.

Future site-specific NEPA documents, tiered from this PEIS, would quantify potential cumulative impacts to water resources.

5.3.6.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

Alternative 3 would have the least cumulative impact to land surface area disturbing approximately an additional 2 acres. Consequently, Alternative 3 would have a lower potential for adverse cumulative impacts to water resources than Alternatives 1 and 2. However, the reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 would have additive cumulative effects on water resources in the region. The cumulative impacts of increased operations on water resources would be similar to those of Alternative 1. Indirect cumulative impacts from expanding operations would be similar to those discussed under Alternative 1.

5.3.7 Cultural Resources

Ongoing CBP infrastructure and operations require some form of ground disturbance, which has the potential to physically impact cultural resources. The proposed BP infrastructure is not expected to produce significant cumulative adverse impacts to cultural resources within the study area because appropriate environmental design and mitigation measures will be implemented through both the NEPA and NHPA Section 106 processes. In addition, fences have precluded illegal foot and vehicular traffic that, in turn, disturb cultural resources within the area (USACE 2001).

Impacts to cultural resources from off-road operations have likely adversely impacted cultural resources in the past and will likely adversely impact cultural resources in the future. Due to the random and spontaneous nature of off-road pursuits, it is impossible to predict where such off-road operations would occur. Subsequently, it is not possible to estimate the amount of cultural resources, if any, which would be impacted by such off-road activities. In addition to BP's off-road operations other off-road activities from private individuals and companies, state, local and federal organizations, along with illegal foot and vehicular traffic, also have the potential to impact cultural resources in the area. These off-road activities, like the BP's off-road operations, are often spontaneous and hard to predict. As a result, it is impossible to estimate the amount of cultural resources that may be impacted by such activities.

5.3.7.1 No Action Alternative

The No Action Alternative would have the least direct cumulative impact on cultural resources, as only the ongoing CBP infrastructure and operations projects would be continued. The potential cumulative direct impact of ongoing actions has subjected an estimated 10,011 acres (16 square miles) to some form of ground disturbance. Section 106 and NEPA compliance analyses have been performed on all past construction projects and would be performed on all approved construction projects. Mitigation measures developed through NEPA and Section 106 compliance analyses would minimize any adverse effects on cultural resources. Furthermore, reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 will likely have adverse cumulative effects on soils in the region. It should be noted though that the majority of the projects outlined include Federal involvement, which would require both NEPA and Section 106 compliance analyses. As a result, impacts on cultural resources resulting from the projects would probably be minimized.

Under this alternative, patrols and off-road operations would be expected to stay at current levels. As a result, potential impacts on cultural resources from BP off-road activities would likely stay at current levels. The continued deterioration of appropriate infrastructure would result in longer apprehension times and increase the operational footprint of the BP. Consequently, potential impacts on cultural resources would be spread over a larger area, but could also be considered significant. In addition to the estimated impact of approved CBP operations and infrastructure, the reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 could have additive cumulative effects on cultural resources in the region where these projects involve off-road activities.

5.3.7.2 Alternative 1. Expand Operations, Technology-Based Systems, and Approved Infrastructure

Alternative 1 would involve an additional 587 acres (0.9 square miles) of ground disturbance by approved projects. The cumulative ground disturbance impact of ongoing and approved CBP operations and infrastructure total 10,598 acres (16 square miles). Section 106 and NEPA compliance analyses have been performed on all past construction projects and would be performed on all future construction projects. Mitigation measures developed through NEPA and Section 106 compliance analysis would minimize any adverse effects to cultural resources.

However, the expansion of operations would result in an increased area of disturbance. Expanded operational area, especially off-road enforcement actions, would have a significant cumulative impact on unknown cultural resources. In addition to the estimated impact of approved CBP operations and infrastructure, the reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 would have cumulative effects to cultural resources of the region. It should be noted though that the majority of the projects outlined include Federal involvement, which would require both NEPA and Section 106 compliance analyses. As a result, impacts to cultural resources resulting from the projects would probably be minimized.

Expansion of operations, implementation of technology-based systems, and improved infrastructure would all contribute to more efficient and effective apprehension of IEs and both concentrate and control disturbance-causing activities of IEs and BP. Although direct impacts to cultural resources from construction activities can be avoided, any increase in off-road activities related to increased operations could potentially disturb unprotected cultural resources. In addition to the estimated impact of approved CBP operations and infrastructure, the reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 would have additive cumulative effects on cultural resources in the region where these projects involve off-road activities.

5.3.7.3 Alternative 2. Expand Technology-Based Systems and Approved Infrastructure

The cumulative impacts to soils would be very similar to Alternative 1. Alternative 2 would cause approximately 587 acres (0.9 square miles) of ground disturbance due to the expansion of infrastructure and technology-based systems operation. The cumulative ground disturbance of Alternative 2 totals 10,598 acres (16 square miles). Section 106 and NEPA compliance analyses have been performed on all past construction projects and would be performed on all future construction projects. Mitigation measures developed through NEPA and Section 106 compliance analysis would minimize any adverse effects to cultural resources. As a result, no significant adverse impacts are anticipated from these ongoing and approved CBP operations and infrastructure. In addition to the estimated impact of CBP technology based operations and infrastructure, the reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 will have additive cumulative effects to cultural resources of the region. It should be noted though that the majority of the projects outlined include Federal involvement, which would require both NEPA and Section 106 compliance analysis. As a result, impacts to cultural resources resulting from the projects would probably be minimized.

Under this alternative, patrols and off-road operations would be expected to decrease, which would decrease the potential of the BP to impact cultural resources within the area. However, without the increase of operations, some areas would continue to be impacted, apprension efficiency would not improve, and the area of impact would not be controlled or concentrated in proximity to the international border. In addition to the estimated impact of approved CBP operations and infrastructure, the reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 could have additive cumulative effects on cultural resources in the region where these projects involve off-road activities.

5.3.7.4 Alternative 3. Expansion of Existing Operations and Technology-Based Systems

Alternative 3 would have the least cumulative ground disturbance totaling approximately an additional 2 acres (cumulative impact of 10,013 acres [16 square miles]). Section 106 and NEPA compliance analyses have been performed on all past construction projects. Mitigation measures developed through NEPA and Section 106 compliance analyses would minimize any adverse effects on cultural resources. As a result, no additional significant adverse impacts are anticipated from these ongoing and approved CBP operations. However, the reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 will have additive cumulative effects on cultural resources in the region. It should be noted though that the majority of the projects outlined include Federal involvement, which would require both NEPA and Section 106 compliance analyses. As a result, impacts on cultural resources resulting from the projects would probably be minimized.

Under this alternative, patrols and off-road operations and their footprint would be expected to increase, which would increase the potential for the BP to impact cultural resources within the area. Due to the lack of physical barriers and other infrastructure, illegal foot and vehicle traffic would also increase, thereby increasing the potential for impacts on cultural resources in the area. Furthermore, the lack of appropriate infrastructure would result in longer apprehension times, which would increase the operational footprint of the BP and potential impacts on cultural resources would be spread over a larger area, and could be significant. Alternative 3 would contribute to significant impacts on cultural resources. In addition to the estimated impact of approved CBP operations and infrastructure, the reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 could have additive cumulative effects on cultural resources in the region where these projects involve off-road activities.

5.3.8 Air Quality

Vehicles, aircraft, and heavy equipment have produced air emissions through normal use (*i.e.*, patrols, dragging, construction, etc.); however, these have not resulted in significant cumulative impacts due to the short duration of the activities, dust suppressant techniques used during construction (*e.g.,* water trucks), and the dispersion capabilities of the region. None of the proposed BP operations or infrastructure improvements would be expected to yield significant cumulative impacts. Furthermore, none of the projects to date have exhibited an exceedence level that could violate air quality standards, especially within non-attainment areas. Thus far, no Federal Class I areas have been affected.

No significant variations in potential cumulative impacts to air quality are anticipated with Alternatives 1, 2, and 3. The reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 are not expected to have cumulative adverse effects to air quality of the region. Future site-specific NEPA documents, tiered from this PEIS, will quantify potential cumulative impacts to air quality.

5.3.9 Socioeconomics

Ongoing CBP construction and maintenance activities have had positive cumulative impacts on socioeconomic resources within the border area and the nation through reductions in crime associated with human smuggling and illegal drug smuggling activities. Direct cumulative impacts of approved CBP actions on socioeconomics would be expected to be beneficial but insignificant. The magnitude of the effects would depend upon the project costs (*i.e.*, local expenditures) and the economic multipliers in the region. At the same time, cumulative indirect effects to socioeconomic resources (*e.g.*, purchase of diesel fuel) would be beneficial and significant, but not easily quantified. BP operations are valuable to society, in ways both obvious and obscure. For example, the costs of a terrorist act caused by a single undetected, unapprehended IE could be catastrophic. The implementation of the Preferred Alternative (Alternative 1) would allow BP to more efficiently and effectively detect, deter, and apprehend IEs, thereby reducing social costs associated with property damages, violent crimes, drug treatment and rehabilitation, and entitlement programs, locally and nationally.

No significant variations in potential cumulative impacts on socioeconomics are anticipated with Alternatives 1, 2, and 3. The reasonably foreseeable CBP and other agency projects presented in Sections 5.1 and 5.2 are not expected to have cumulative adverse effects on socioeconomic

resources of the region. Future site-specific NEPA documents, tiered from this PEIS, will quantify potential cumulative impacts on socioeconomic resources.

SECTION 6.0
ENVIRONMENTAL DESIGN MEASURES

6.0 ENVIRONMENTAL DESIGN MEASURES

This chapter describes those measures anticipated to be implemented to reduce or eliminate potential adverse impacts to the human and natural environment. The CBP/BP has incorporated many of these measures as standard operating procedures on past projects. The mitigation measures are presented for each resource category that could be potentially affected. It should be emphasized that these are general measures; development of specific measures will be required for each current and future action once the specific location and project design is identified. Specific measures will also be identified and addressed in site-specific NEPA documents. The proposed measures will be coordinated through the appropriate agencies and land managers or administrators. The Sector Chief will be responsible for the implementation and maintenance of mitigation measures in their respective Sector's AO.

6.1 BIOLOGICAL RESOURCES

Professional biologists will be utilized to perform field surveys of technology-based systems sites and special operations, as appropriate, as early as possible in the planning and design stages in order to avoid sensitive biological resources. These surveys will be coordinated with the appropriate Federal and state agencies. All areas which are known to support threatened or endangered species will be considered off limits to avoid impacts to these resources, to the extent practicable. If possible, construction activities will be scheduled at times when they are least likely to disturb breeding and nesting activities. Additionally, BP will minimize losses to vegetation by: (1) trimming vegetation along roadsides rather than removing entire plants, (2) requiring heavy equipment to utilize road pullouts or other such disturbed areas, and (3) ensuring revegetation efforts following completion of ground disturbing activities. Disturbed sites or sites with low quality habitat will be utilized to the maximum extent practicable for construction and operational support activities.

To comply with Executive Order 13112 on Invasive Species (64 FR 6183, February 8, 1999), operation and construction activities will minimize ground disturbance when possible. However, when disturbance is unavoidable, the BP will coordinate with the USFWS and other land managers to determine revegetation measures. Revegetation of disturbed areas will be addressed under site-specific NEPA documents. Weed seed free horse feed will be utilized by BP horse units operating in sensitive areas to further decrease the potential of promoting the

establishment and spread of invasive species by BP activities. Weed seed free horse feed is certified to be free of noxious weed seeds for specific states.

The Migratory Bird Treaty Act (MBTA)(16 U.S.C. §703, *et.seq.*) requires contractors to obtain a construction permit if the construction activity is scheduled during nesting seasons (March through August). Surveys shall be performed to identify active nests, so that these nests could be avoided during construction. Another mitigation measure that will be considered is scheduling all construction activities outside the nesting season (September through February).

Unique and sensitive habitats and areas such as caves, riparian communities, parks, refuges, Wilderness Areas, conservation areas, national forests, scenic streams, unique vegetation communities, or other sensitive resources shall be avoided to the maximum extent practicable. Any unavoidable effects to such communities shall be closely coordinated with the appropriate Federal and/or state agency(s) to ensure that impacts are kept to an absolute minimum and that restoration actions are considered and implemented, where plausible. Road-kill impacts may potentially increase due to the completion of on going and currently approved infrastructure (*i.e.*, road maintenance, vehicle barriers, fences). However, BP is committed to avoid impacts to the greatest extent plausible through agent education and minimization of disturbance areas. Permanently stationed agents shall receive biannual training regarding sensitive habitats and protected species. Agents on temporary assignment shall receive training regarding sensitive habitats and areas and protected species for the respective station to which he or she is assigned.

Environmental design features that will be considered, especially in areas that support protected species, include the development of vegetation corridors to avoid and/or minimize habitat fragmentation and the proper placement and size of culverts to adequately transport storm water and allow wildlife to safely cross roads. Habitat fragmentation will be minimized to an extent of insignificance by development of safe and effective corridor systems (wildlife pathways) that allow free movement of animals across the international border. Corridors act as a connection between two or more otherwise isolated habitats and provide for animal movement and reproduction. It must be noted that no one wildlife corridor design would completely mitigate habitat fragmentation alone. Project specific mitigation measures, as appropriate, shall be required for projects with the potential to cause substantial impacts on wildlife habitat, protected species, or other environmentally sensitive resources; these plans will be closely

coordinated with, and approved by, the USFWS and appropriate state resource agency(s) prior to initiation of construction. It is policy, however, to mitigate adverse impacts through the sequence of avoidance, minimization, and finally, compensation. The CBP and BP coordinate with the USFWS to obtain the most current information available about species status, habitat requirements, potential project impacts, and environmental design measures to avoid, minimize, and/or compensate for impacts. Compensation varies and includes activities such as restoration of habitat in other areas and acquisition of lands and is coordinated with the USFWS and appropriate state resource agencies.

The BP air operations shall avoid known concentrations of Sonoran pronghorn on normal, routine flights. Known fawning areas (*i.e.*, Mohawk Dunes, Pinta Sands) will be avoided to the maximum extent possible during the peak fawning period (April through June). Deviation to routine flight patterns is conducted in response to "sign" or evidence of illegal entry. Helicopters from the Yuma Sector that leave the patrol route to fly to the Ajo Station at Why, Arizona for refueling will fly at a higher altitude, generally between 100 and 200 feet, and will not engage in hovering activities except in emergency situations.

As part of the informal consultation under Section 7 of the ESA for the establishment and operation of rescue beacons, the CBP and the BP agreed to the following mitigation measures to reduce or minimize potential effects to the Sonoran pronghorn: (1) a blue colored beacon light will be used for the six beacons in the Ajo Station's AO located west of Highway 85 in current Sonoran pronghorn habitat; (2) BP helicopters shall avoid any helicopter over flights of the semi-captive breeding facility for the Sonoran pronghorn in Child's Valley on the CPNWR and the BP shall avoid existing and future forage enhancement plots with helicopter over flights; (3) the BP shall annually report to the USFWS all rescue missions conducted in Sonoran pronghorn habitat, as part of the reporting for formal consultation on Tucson Sector activities; (4) the BP shall minimize over flights of Sonoran pronghorn fawning areas from March 15 to July 15 of each year, unless conducting rescue missions in these areas; and (5) the BP shall minimize hovering and landings by helicopters over current Sonoran pronghorn habitat to the maximum extent practicable. As part of the mitigation requirements for Operation Desert Grip, the BP provided $50,000.00 to the USFWS for Sonoran pronghorn habitat improvements and to study impacts caused by IEs. The USFWS and BP has proposed the installation of permanent vehicle barriers on the CPNWR as a potential conservation measure for the ongoing formal

Section 7 consultations for the Yuma Sector. This same measure will be proposed as part of the upcoming formal Section 7 consulation for the Tucson Sector.

According to BLM's Conservation Agreement with the USFWS for the flat-tailed horned lizard, environmental design measures include minimizing surface disturbance projects to a level of one percent of the management area over five years; collecting compensation fees; prohibiting off-highway competitive events; supporting continuing lizard monitoring and research; and attempting to acquire all private in-holdings. Like most plans, the flat-tailed horned lizard Conservation Agreement is a working document subject to revision. Therefore, during the planning phase of potential projects in the Yuma Desert Management Unit, the CBP and BP will, to the extent practicable observe conservation measures included as part of the Conservation Agreement for the flat-tailed horned lizard. Field surveys for the flat-tailed horned lizard will be performed prior to the initiation of any construction activities as part of the site-specific NEPA documentation. Coordination efforts will continue with the USFWS to obtain the most current information available about species status, habitat requirements, potential project impacts, and environmental design measures to avoid, minimize, and/or compensate for impacts. If construction occurs in areas known to support threatened and endangered species, bio-monitors could be used.

6.2 CULTURAL RESOURCES

Potential adverse impacts to cultural resources are mitigated through a policy of site avoidance. The continuation of archeological surveys and monitoring of potentially ground disturbing BP activities shall ensure that cultural resources deemed to be potentially eligible for NRHP listing are avoided. Consequently, such activities will have no effect on historic properties. Surveys and monitoring on Native American Nation properties will be performed in conjunction with and upon approval of the appropriate Indian Tribal Government. The CBP/BP will be responsible for coordinating with the Arizona SHPO along with the appropriate THPO, if applicable, for maintenance activities involving earth-moving operations in areas where historic properties have been previously identified. This coordination is necessary to ensure mitigation measures are implemented. Mitigation measures that could be used, when approved by the SHPO and/or THPO, to preclude impacts include, but are not limited to, data recovery, preservation through site burial, and use of professional archeologists as monitors during construction.

The revised regulations at 36 C.F.R. Part 800 strongly emphasize the roles of tribes as consulting parties. According to Section 800.2(c)(2)(ii), Federal agencies are required to consult not only with the SHPO and/or the THPO, but also with relevant tribes that might claim cultural or religious affinity in the area of the undertaking. Such consultation will take place on all Federal undertakings subject to Section 106 review. Such consultation will occur for all levels of the Section 106 process. The following tribes claim cultural affinity to the current study areain Arizona: Ak-Chin Indian Community, Gila River Indian Community, Tohono O'odham Nation, Hopi, Salt River Pima-Maricopa Indian Community, Yavapai, Zuni Pueblo, Fort Yuma – Quechan, San Carlos – White Mountain Apache Yavapai Prescott, Y-Apache, Hia C-ed O'odham, Fort Mohave, and the Cocopah (ASP 1999).

All construction activities shall be at least two feet away from the international boundary to avoid impacts to historical boundary monuments and other demarcations. Near each permanent boundary monument, strict construction precautions shall be implemented to avoid potential damage to them.

6.3 AIR QUALITY

Proper and routine maintenance of all vehicles, generators, aircraft and other equipment shall be implemented to ensure that air emissions are within the design standards of the equipment. Construction activities within non-attainment areas will be coordinated with the appropriate environmental agency(s) to ensure that the emissions will conform to regulations specified in the Clean Air Act. Construction sites within urban areas, along major transportation routes, or in biologically sensitive areas (*e.g.*, wildlife refuges) shall be kept wet, to the extent practicable, to reduce fugitive dust emissions. Where practicable, drop lines from local electrical systems shall be used as a substitute for generators. When electrical service is not available, generators will utilize low-sulfur fuels, such as diesel fuel or natural gas, to minimize emissions to the extent practicable.

6.4 WATER RESOURCES

Each proposed construction project that affects greater than 1 acre will require a SWPPP as part of the National Pollution Discharge Elimination System (NPDES) permit process under the CWA. The SWPPP is utilized by the entity(s) performing construction (*e.g.*, CBP personnel, JTF NORTH, Arizona National Guard or independent contractors) to avoid and minimize

impacts to water resources. All proposed projects that affect international water bodies would be coordinated with the USIBWC for review and approval. The IBWC will not permit projects if there are adverse impacts to the international monuments or drainage patterns. Similarly, if wetlands or other waters of the US are to be affected, early coordination by the CBP with the USACE Los Angeles District, Regulatory Branch (jurisdictional authority over the USACE Phoenix Field Office) and Arizona Department of Water Resources agencies will be conducted. Applicable Section 404 permit and Section 401 Water Quality Certification procedures shall be completed prior to initiation of the construction activities, as required. Mitigation and compensation shall be implemented to ensure no functional net loss of waters of the US, including wetlands.

No action shall be initiated that may affect wetlands or floodplains without performing the requisite analysis and findings specified by Executive Orders 11990 and 11988 respectively, prior to taking any action. The CBP/BP generally does not directly implement construction. JTF NORTH, National Guard units (typically the Arizona National Guard), and independent contractors implement construction for the CBP/BP within the Tucson and Yuma Sectors. Project-specific SWPPPs are provided to the construction entity that identify conservation measures to avoid and minimize water resource impacts. Some of those measures are presented here for reference. The construction storage or staging sites will be located at least 0.5 mile from wildlife and livestock tanks or other permanent surface water bodies to reduce potential effects of accidental spills. Conservation measures will be implemented to preclude unnecessary waste of water supplies. Discharges of gray water and other wastes to drainages or other water courses/bodies are prohibited. However, gray water may be used for irrigation and dust suppression (*i.e.*, road watering) if coordinated and approved by the land management agency. Portable latrines, provided and maintained by licensed contractors, shall be used to the extent practicable during construction and operational support activities.

Water conservation measures shall be considered for operations or construction projects within the Sierra Vista sub-watershed. Water conservation measures for Sierra Vista air operations will be included as part of the required Section 7 consultation for the Tucson Sector BA. Potential water conservation measures may include low water-use fixtures, low water-use landscaping, installation and use of waterless urinals, restrictive landscape watering policy and enforcement, and the use of gray water for irrigation. Where necessary, floodplain permits would be obtained prior to construction.

6.5 HAZARDOUS MATERIALS

A SPCCP will be in place prior to the start of construction projects, and all personnel will be briefed on the implementation and responsibilities of this plan. The SPCCP is utilized by the entity(s) performing construction (*e.g.*, CBP personnel, JTF NORTH, Arizona National Guard, or independent contractors) to avoid and minimize impacts associated with hazardous materials during construction. A designated environmental advisor will be on-site during construction activities in case of any accidents.

Some of those measures generally contained in the SPCCP are presented herein for reference. To minimize potential impacts from hazardous and regulated materials at construction sites, all fuels, waste oils, and solvents will be collected and stored in tanks or drums within a secondary containment that consists of an impervious floor and bermed sidewalls capable of containing the volume of all containers plus 50 percent of the aggregate volume stored therein. Following accepted guidelines will complete refueling machinery, including portable lights,, and all vehicles will have drip pans during storage to contain minor spills and drips. Any spill of 5 gallons or more will be contained immediately within an earthen dike, and the application of an absorbent (*e.g.*, granular, pillow, sock, etc.) will be used to absorb and contain the spill. Any major spill of 5 gallons or more of a hazardous or regulated substance will be reported immediately to the on-site environmental advisor who will notify appropriate Federal and state agencies.

All used oil and solvents will be recycled if possible. All non-recyclable hazardous and regulated wastes will be collected, characterized, labeled, stored, transported, and disposed of in accordance with all Federal, state, and local regulations, including proper waste manifesting procedures.

6.6 NOISE

Mitigation of noise levels may occur at the noise source, along the path of the noise, or at receiver locations. Mitigation of noise levels occur in nature to varying degrees as sound propagates from the source over terrain surfaces (scattering and ground attenuation), as the distance between the source and receiver increases (dispersion), and when intervening natural terrain features intersect the path of the noise source to the receiver (diffraction). Within

practical limits, these principles shall be applied to the mitigation of noise levels from proposed construction and operations.

Placing roadways and heliports away from sensitive receptors can potentially reduce noise impacts. However, the selection of alternative alignments and profiles for noise abatement purposes must consider the balance between noise impacts and other engineering and environmental parameters.

Acquisition of real property or interests therein to serve as buffer zones is also practical for this project. Noise insulation of buildings, such as schools, provides an additional type of mitigation, which is available for reducing noise levels, although this method will only potentially reduce noise levels inside the building and will not benefit outdoor activities.

The following mitigation strategies may be employed, to the extent practicable to limit the potential impact of noise. Since infrastructure considered as part of this project will be located in remote and/or non-developed areas, the mitigation required is expected to be minimal.

- Source Control - This option includes regular equipment maintenance especially including designed engine enclosures, intake silencers and exhaust systems that are functioning properly.
- Site Control - This option includes placement of stationary equipment as far away from sensitive receptors as possible (*i.e.*, pumps, compressors, aggregate crushers, AC plants, operators, etc.), choice of disposal sites/haul routes, and employing shielding where possible.
- Time and Activity Constraints - Schedule of operations to coincide with periods when the environment is least likely to be affected. This includes limiting working hours and workdays to the least noise-sensitive times.
- Community Awareness - This option includes public notification of construction operations.

SECTION 7.0
REFERENCES

7.0 REFERENCES

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SECTION 10.0
ABBREVIATIONS/ACRONYMS

10.0 ABBREVIATIONS/ACRONYMS

ABCI	Arizona Border Control Initiative
ACEC	Area of Critical Environmental Concern
ACHP	Advisory Council on Historic Preservation
ADEQ	Arizona Department of Environmental Quality
ADOT	Arizona Department of Transportation and Development
AGFD	Arizona Game and Fish Department
AGL	Above-Ground Level
AO	Area Of Operation
ATV	All-Terrain Vehicle
BA	Biological Assessment
BANWR	Buenos Aires National Wildlife Refuge
BLM	Bureau of Land Management
BMGR	Barry M. Goldwater Range
BMP	Best Management Practices
BP	US Border Patrol
CAA	Clean Air Act
CBP	Customs and Border Protection
CCP	Comprehensive Conservation Plan
CEQ	President's Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulation
CO	Carbon Monoxide
CPNWR	Cabeza Prieta National Wildlife Refuge
CWA	Clean Water Act
dB	Decibel
DNL	Day-night average noise level
DOD	Department of Defense
DHS	Department of Homeland Security
EA	Environmental Assessment
ESA	Endangered Species Act
°F	Degrees Fahrenheit
FAA	Federal Aviation Administration
FHWA	Federal Highway Administration
FY	Fiscal Year
GTR	Geronimo Trail Road
Hz	Hertz
IAQCR	Intrastate Air Quality Control Regions
ICAD	Intelligent Computer Aided Detection
IIRIRA	Illegal Immigration Reform and Immigrant Responsibility Act
IE	Illegal Entrants
INA	Immigration and Nationality Act
INRMP	Integrated Natural Resources Management Plan
INS	Immigration and Naturalization Service)
ISIS	Integrated Surveillance Intelligence Systems;
JTF-6	Joint Task Force Six
JTF NORTH	Joint Task Force North
LCNWR	Leslie Canyon National Wildlife Refuge
LCRV	Lower Colorado River Valley

Leq	Time-averaged equivalent noise level
LUST	Leaking Underground Storage Tanks
MBTA	Migratory Bird Treaty Act
MCAS	U. S. Marine Corps Air Station
msl	Mean Sea Level
NAAQS	National Air Ambient Quality Standards
NCA	National Conservation Area
NEPA	National Environmental Policy Act)
NMFS	National Marine Fisheries Service
NO_2	Nitrogen Dioxide
NO_x	Nitrogen Oxides
NPDES	National Pollution Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places
NWP	Nationwide Permit
O_3	Ozone
OPCNM	Organ Pipe Cactus National Monument
PCPI	Per Capita Personal Income
PEIS	Programmatic Environmental Impact Statement
PM_{10}	Particulate Matter less than Ten Microns
POE	Port of Entry
RNA	Research Natural Area
ROI	Region of Influence
RVS	Remote Video Surveillance System
SAR	Search and Rescue
SBNWR	San Bernadino National Wildlife Refuge
SHPO	State Historic Preservation Office
SO_2	Sulfur Dioxide
SPCCP	Spill Containment and Countermeasures Plans
SPEIS	Supplemental Environmental Impact Statement
SPRNCA	San Pedro Riparian National Conservation Area
SWPPP	Stormwater Pollution Prevention Plan
TCP	Traditional Cultural Properties
T/E	Threatened/Endangered Species
THPO	Tribal Historic Preservation Officer
TMDL	Total Maximum Daily Loads
TNC	The Nature Conservancy
TPI	Total Personal Income
TSP	Total Suspended Particulates
US	United States
USACE	US Army Corps of Engineers
USIBWC	US Section, International Boundary and Water Commission
USC	United States Code
USCIS	US Citizenship and Immigration Service
USEPA	US Environmental Protection Agency
USFS	US Forest Service
USFWS	US Fish and Wildlife Service
USMC	US Marine Corps
VOC	Volatile Organic Compounds
VMT	Vehicle Miles Travel
WC	Wildlife of Concern

SECTION 11.0
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11.0 INDEX

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APPENDIX A
PUBLIC INVOLVEMENT

NOTICE OF INTENT

for the Standards for the Classification of Federal Data on Race and Ethnicity.

6. An estimate of the total number of respondents and the amount of time estimated for an average respondent to respond: 17,667 agencies with 106,002 responses (including zero reports); and with an average of 6 hours and 35 minutes annually devoted to compilation of data for this information collection.

7. An estimate of the total public burden (in hours) associated with both collections: 15,900 annually.

Public comments on this proposed information collection are strongly encouraged.

If additional information is required contract: Mr. Robert B. Briggs, Department Clearance Officer, U.S. Department of Justice, Information Management and Security Staff, Justice Management Division, Suite 1221, National Place Building, 1331 Pennsylvania Ave., NW, Washington, DC 20530.

Dated: July 27, 2000.

Robert B. Briggs,

Department Clearance Officer, Department of Justice.

[FR Doc. 00-19358 Filed 7-31-00; 8:45 am]

BILLING CODE 4410-02-M

DEPARTMENT OF JUSTICE

Immigration and Naturalization Service

[INS No. 2082-00]

Notice of Intent To Prepare a Draft Environmental Impact Statement for the Implementation of Border Barriers for Enforcement Initiatives in Arizona

AGENCY: Immigration and Naturalization Service (INS), Justice.

ACTION: Notice of Intent to Prepare a Draft Environmental Impact Statement (DEIS).

SUMMARY:

Proposed Action

In furtherance of its mission to gain and maintain control of the Arizona border, in 1994, the INS launched Operation Safeguard, an aggressive initiative that brought new agents, equipment, and technology to the Tucson Border Patrol Sector. The goal of Operation Safeguard is to heighten deterrence and improve control along the nearly 300 miles of international border in Arizona. The aim of INS' comprehensive border enforcement effort, which includes Operation Gatekeeper in California and Operations Hold the Line and Rio Grande in Texas, is to reduce the adverse effects of illegal immigration and improve the quality of life for residents along the immediate border and throughout the nation. The INS will now expand Operation Safeguard by utilizing new resources and technology within the following Arizona Border Patrol stations: Ajo/Why, Casa Grande, Douglas, Naco, Nogales, Sonoita, Tucson, Wellton, Wilcox, and Yuma. The enhancements will bolster the efforts to ensure the safety of migrants, ranchers, and local residents, as well as provide increased safety of operations for agents. Enhancement will include, but not be limited to, additional Border Patrol personnel, support vehicles, air support, border barriers, lighting, border road improvements, and remote video surveillance systems.

Alternatives

In developing the DEIS, the options of no action and alternatives for Operation Safeguard will be fully and thoroughly examined.

Scoping Process

During the preparation of the DEIS, there will be numerous opportunities for public involvement in order to determine the environmental issues to be examined. The meetings will be well publicized and held at a time which will make it possible for the public and interested agencies or organizations to attend. Scoping meetings will be held in Douglas, Tucson, Yuma, and Nogales, Arizona. Notice of the Scoping meetings will be published in local newspapers prior to the meetings indicating the date, time, and location of each Scoping meeting.

DEIS Preparation

Public notice will be published in the **Federal Register** concerning the availability of the DEIS for public review and comment.

FOR FURTHER INFORMATION CONTACT: Manny Rodriguez, Chief Policy and Planning, Immigration and Naturalization Service, Facilities and Engineering Branch, 425 I Street, NW., Washington, D.C. 20536, Room 2060, Telephone: 202-353-0383.

Dated: July 25, 2000.

Doris Meissner,

Commissioner, Immigration and Naturalization Service.

[FR Doc. 00-19335 Filed 7-31-00; 8:45 am]

BILLING CODE 4410-10-M

DEPARTMENT OF LABOR

Employment and Training Administration

Notice of Determinations Regarding Eligibility To Apply for Worker Adjustment Assistance and NAFTA Transitional Adjustment Assistance

In accordance with section 223 of the Trade Act of 1974, as amended, the Department of Labor herein presents summaries of determinations regarding eligibility to apply for trade adjustment assistance for workers (TA-W) issued during the period of July 2000.

In order for an affirmative determination to be made and a certification of eligibility to apply for worker adjustment assistance to be issued, each of the group eligibility requirements of section 222 of the Act must be met:

(1) That a significant number or proportion of the workers in the workers' firm, or an appropriate subdivision, thereof, have become totally or partially separated;

That sales or production, or both, of the firm or subdivision have decreased absolutely; and

(3) That increases of imports of articles like or directly competitive with articles produced by the firm or appropriate subdivision have contributed importantly to the separations, or threat thereof, and to the absolute decline in sales or production.

Negative Determinations for Worker Adjustment Assistance

In each of the following cases the investigation revealed that criterion (3) has not been met. A survey of customers indicated that increased imports did not contribute importantly to worker separations at the firm.

TA-W-37,403; R. Daye Limited, New York, NY

TA-W-37,596; The Bethlehem Corp., Easton, PA

In the following cases, the investigation revealed that the criteria for eligibility have not been met for the reasons specified.

TA-W-37,837; American General Assurance Co., Reading, PA

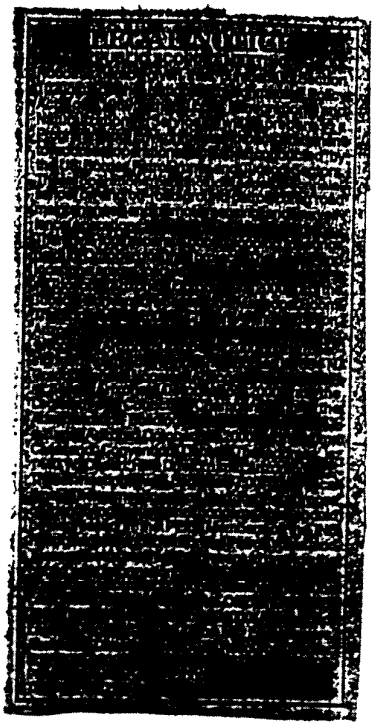
TA-W-37,763; Destination Film Distribution Co., Inc., Wheelman Products, Santa Monica, CA

TA-W-37,762; Hearst Entertainment, King Telpro Productions, Los Angeles, CA

TA-W-37,623; Lear Corp., Mold and die Shop, El Paso, TX

TA-W-37,836; Shenandoah Rag Co., Inc., Shenandooh, PA

PUBLIC SCOPING



STAR PUBLISHING COMPANY

Tucson, Arizona

STATE OF ARIZONA)
COUNTY OF PIMA)

Janice Anderson, being first duly sworn deposes and says: that she is the Legal Advertising Representative of the **STAR PUBLISHING COMPANY**, a corporation organized and existing under the laws of the State of Arizona, and that the said **STAR PUBLISHING COMPANY** prints and publishes The Arizona Daily Star, a daily newspaper printed and published in the City of Tucson, Pima County, State of Arizona, and having a general circulation in said City, County, State and elsewhere, and that the attached

Legal Notice

was printed and published correctly in the entire issue of the said The Arizona Daily Star on each of the following dates, to-wit:

September 12, 2000

Janice Anderson

Subscribed and sworn to before me this 13th day of September, 2000

Notary Public

OFFICIAL SEAL
LYNETTE J. VAN ARB
NOTARY PUBLIC - ARIZONA
PIMA COUNTY
My Comm. Expires Sept. 2, 2001

My commission expires

TNI AD NO. 900492

AFFIDAVIT OF PUBLICATION

STATE OF ARIZONA)
:ss.
COUNTY OF COCHISE)

KIMBERLY L. MARINUS being first duly sworn, deposes and says: That (he) (she) is the Agent to the Publisher of the SIERRA VISTA HERALD and the BISBEE DAILY REVIEW newspapers printed and published six days a week in the County of Cochise, State of Arizona, and of general circulation in the cities of Sierra Vista and Bisbee, County of Cochise, State of Arizona and elsewhere, and the hereto attached

PUBLIC SCOPE MEETING
PREPARE PROGRAMMATIC
ENVIRONMENTAL IMPACT
STATEMENT TO ADDRESS
OPERATIONAL ACTIVITY

was printed and published correctly in the regular and entire issue of said SIERRA VISTA HERALD and BISBEE DAILY REVIEW for 1 issues, that the first was made on the 11th day of SEPTEMBER ~~19~~ 20 00 and the last publication thereof was made on the 11th day of SEPTEMBER ~~19~~ 20 00 that said publication was made on each of the following dates, to wit:

09/11/00

PUBLIC NOTICES

PUBLIC SCOPING MEETINGS

Notice is hereby given that pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969, the U.S. Immigration and Naturalization Service will prepare a Programmatic Environmental Impact Statement to address operational activities conducted by the U.S. Border Patrol Yuma and Tucson Sectors. These operations can include aerial reconnaissance, on- and off-road ground patrols, drag road maintenance, and remote sensing and surveillance operations.

There will be four separate public scoping meetings held in October for this project. The dates and locations are as follows:

- Tucson, Arizona, October 3, 2000, at the Tucson Convention Center, the Maricopa Room. The address is: 260 S. Church Avenue, Tucson, Arizona.
- Nogales, Arizona, October 4, 2000, in the meeting room at the Days Inn. The address is: 884 N. Grand Avenue, Nogales, Arizona.
- Sells, Arizona, October 5, 2000, at the Legislative Council Chambers, in the Administration Building.
- Yuma, Arizona, October [illegible], 2000, at the Yuma Civic and Convention Center. The address is: 1440 W. Desert Hills Drive, Yuma, Arizona.

These meetings will begin at 7:00 p.m. (doors open [illegible]). These meetings are held for the purpose of identifying issues and concerns that should be addressed in the PEIS. Members of the INS Headquarters and U.S. Border Patrol Yuma and Tucson Sectors will be present to provide the public with information.

For more information contact either: Mr. Joe Lamphear, INS Environmental Officer (949) 425-7081; INS Western Region, 24000 Avila Road, Laguna Niguel, CA 92677 or Mr. Eric Verwers, Assistant Director, INS A-E Resource Center, (817) 978-0202.

Publish: September 11, 2000

Request of

GULF SOUTH RESEARCH CORP.

Sierra Vista Herald
Bisbee Daily Review

By [signature]

Subscribed sworn to before me this 11th day of SEPTEMBER ~~19~~ 20 00

OFFICIAL SEAL
JOAN HANCOCK
Notary Public - Arizona
COCHISE COUNTY
My Comm Exp 5/21/2004

Notary Public in and for the County of Cochise, State of Arizona

My Commission Expires: 5/21/2004

BW1 FOIA CBP 008692

AFFIDAVIT OF PUBLICATION

STATE OF ARIZONA }
COUNTY OF SANTA CRUZ } ss.

DON HENSON being of first duly sworn, deposes and says: that he/she is PUBLISHER of the NOGALES INTERNATIONAL, a newspaper published in the County of Santa Cruz, State of Arizona, and of general circulation in said County, State and elsewhere, and that the hereto attached legal notice

NOTICE OF PUBLIC SCOPING MEETING - October 2000

was printed and published correctly in the regular and entire issue of said NOGALES INTERNATIONAL for 1 issues; that the first publication was made on the 12 day of September, 20 00, and the last publication thereof was made on the 12 day of September, 20 00.

NOGALES INTERNATIONAL

By _____

Subscribed and sworn to before me this 12 day of September, 20 00

_____ Notary Public

My commission expires

OFFICIAL SEAL
SANDRA L. MORALES
Notary Public - State of Arizona
SANTA CRUZ COUNTY
My Comm. Expires Jan. 11, 2001

PUBLIC SCOPING MEETING

Notice is hereby given that, pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969, the U.S. Immigration and Naturalization Service will prepare a Programmatic Environmental Impact Statement to address operational activities conducted by the U.S. Border Patrol Yuma and Tucson Sectors. These operations can include aerial reconnaissance, on- and off-road ground patrols, drag road maintenance and remote sensing and surveillance operations.

There will be four separate public scoping meetings held in October for this project. The dates and locations are as follows:

Tucson, Arizona, October 3, 2000, at the Tucson Convention Center, the Maricopa Room. The address is: 260 S. Church Avenue, Tucson, Arizona.

Nogales, Arizona, October 4, 2000, in the meeting room at the Days Inn. The address is: 884 N. Grand Avenue, Nogales, Arizona.

Sells, Arizona, October 5, 2000, at the Legislative Council Chambers, in the Administration Building.

Yuma, Arizona, October 17, 2000, at the Yuma Civic and Convention Center. The address is: 1440 W. Desert Hills Drive, Yuma, Arizona.

These meetings will begin at 7:00 p.m. (local time). These meetings are held for the purpose of identifying issues and concerns that should be addressed in the PEIS. Members of the INS Headquarters and U.S. Border Patrol Yuma and Tucson Sector staff will be present to provide the public with information.

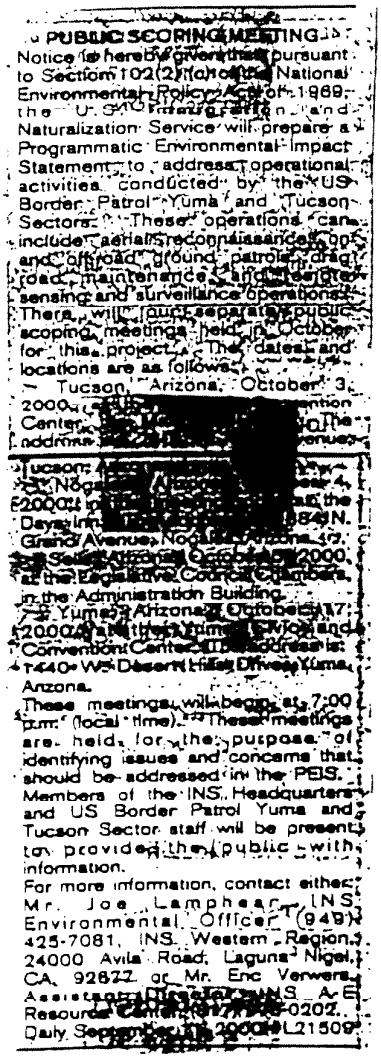
For more information, contact either Mr. Joe Campbell, INS Environmental Officer (949) 425-7081, INS Western Region, 24000 Avila Road, Laguna Niguel, CA. 92677 or Mr. Eric Verwers, Assistant Director, INS I-E Resource Center, (817) 978-0202.

Pub: 9/12/00
Req: GSR

Publisher's Affidavit of Publication

ooo

STATE OF ARIZONA }
COUNTY OF YUMA }



PUBLIC SCOPING MEETING

Notice is hereby given that pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969, the U.S. Immigration and Naturalization Service will prepare a Programmatic Environmental Impact Statement to address operational activities conducted by the US Border Patrol Yuma and Tucson Sectors. These operations can include aerial reconnaissance, on and off-road ground patrols, drag road maintenance, and intelligence sensing and surveillance operations. There will four separate public scoping meetings held in October for this project. The dates and locations are as follows:

Tucson, Arizona, October 3, 2000, at the [redacted] Center, [redacted]

Tucson, Arizona, October 4, 2000, at the [redacted] Days Inn, [redacted] N. Grand Avenue, Nogales, Arizona.

San Luis, Arizona, October 16, 2000, at the Legislative Council Chambers, in the Administration Building.

Yuma, Arizona, October 17, 2000, at the Yuma Civic and Convention Center. The address is: 1440 W. Desert Hills Drive, Yuma, Arizona.

These meetings will begin at 7:00 p.m. (local time). These meetings are held for the purpose of identifying issues and concerns that should be addressed in the PEIS. Members of the INS Headquarters and US Border Patrol Yuma and Tucson Sector staff will be present to provide the public with information.

For more information, contact either: Mr. Joe Lamphear, INS Environmental Officer, (949) 425-7081, INS Western Region, 24000 Avila Road, Laguna Niguel, CA 92677, or Mr. Eric Verwers, Assistant Director, INS Asylum Resource Center, [redacted]-0202.

Daily September 11, 2000 L21509

Julie Moreno or Lee Knapp, having been first duly sworn, deposes and says: that The Yuma Daily Sun is a newspaper of general circulation published daily in the City of Yuma, County of Yuma, State of Arizona; that (s)he is the publisher or business manager of said paper; that the

PUBLIC SCOPING MEETING

a printed copy of which, as it appeared in said paper, is hereto attached and made a part of this affidavit, was published in The Yuma Daily Sun

For ONE issues; that the date of the first publication of said PUBLIC SCOPING MEETING

was SEPTEMBER 11 ,2000 and the date of the last publication being SEPTEMBER 11 ,2000 and that the dates when said

PUBLIC SCOPING MEETING

was printed and published in said paper were

SEPTEMBER 11, 2000

Lee Knapp

Subscribed and sworn to before me, by the said Julie Moreno or Lee Knapp

29th day of September, 2000

OFFICIAL SEAL
VIRGEN P PEREZ
Notary Public - State of Arizona
YUMA COUNTY
My Comm. Expires MAY 10, 2001

Virgen P. Perez Notary Public

My commission expires May 10, 2001

The Daily Dispatch

530 11th Street, Douglas, AZ 85607 • (520) 364-3424

Monica Martinez, being first duly sworn deposes and says that she is an agent of The Daily Dispatch, a daily newspaper, published in the City of Douglas, County of Cochise, State of Arizona: That the Notice, a copy of which is hereto attached, described as follows:

Public Scoping Meeting

____

____

was published daily in the entire and regular issue of said THE DAILY DISPATCH, for 1 consecutive weeks, the FIRST publication of said notice being ________ in the issue dated ________________, and the LAST publication being in the issue dated Aug. 2, 2000.

The deponent further says that the Notice was published in the newspaper proper, and not in a supplement thereof.

(SIGNED) Monica Martinez

Sworn and Subscribed to me this 1st day of September, 2000

OFFICIAL SEAL
LAWRENCE L. BLASKEY
NOTARY PUBLIC - ARIZONA
COCHISE COUNTY
[illegible] 2, 2003

____
Notary Public

My commission expires: June 2, 2003

PUBLIC NOTICE

PUBLIC SCOPING MEETING

Notice is hereby given that pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969, the U.S. Immigration and Naturalization Service will prepare a Programmatic Environmental Impact Statement to address operational activities conducted by the U.S. Border Patrol Yuma and Tucson Sectors. These operations can include aerial reconnaissance, on and off-road ground patrols, drag road maintenance and remote sensing and surveillance operations.

A public scoping meeting was previously scheduled for August 8, 2000 but has been postponed until August 22, 2000. The meeting will be conducted in Douglas, Arizona with the purpose of identifying issues and concerns that should be addressed in the PEIS. Member of the INS headquarters and U.S. Border Patrol Yuma and Tucson Sector staff will be present to provide the public with information. Other public scoping meetings also will be held at [illegible] other locations throughout the Tucson and Yuma Sectors [illegible]. The [illegible]

The meeting will take place between [illegible] p.m. at the [illegible] Theater [illegible] Building [illegible] Douglas [illegible] Arizona [illegible]

For more information, contact either [illegible] Environmental [illegible] [illegible] Road [illegible]

Published 8/2/00 [illegible]

STAR PUBLISHING COMPANY

Tucson, Arizona

STATE OF ARIZONA)
COUNTY OF PIMA)

Janice Anderson, being first duly sworn deposes and says: that she is the Legal Advertising Representative of the **STAR PUBLISHING COMPANY**, a corporation organized and existing under the laws of the State of Arizona, and that the said **STAR PUBLISHING COMPANY** prints and publishes The Arizona Daily Star, a daily newspaper printed and published in the City of Tucson, Pima County, State of Arizona, and having a general circulation in said City, County, State and elsewhere, and that the attached

Legal Notice

was printed and published correctly in the entire issue of the said The Arizona Daily Star on each of the following dates, to-wit:

July 26, 2000

Janice Anderson

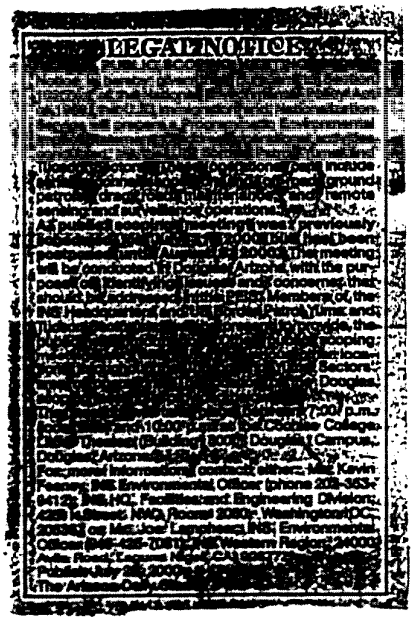
Subscribed and sworn to before me this 27th day of July, 2000

Notary Public

OFFICIAL SEAL
LYNETTE J. VAN ARB
NOTARY PUBLIC - ARIZONA
PIMA COUNTY
My Comm. Expires Sept. 2, 2001

My commission expires

INI AD NO. 830552


LEGAL NOTICE

Publisher's Affidavit of Publication

oOo

STATE OF ARIZONA }
COUNTY OF YUMA }

PUBLIC SCOPING MEETING

Notice [illegible] pursuant to Section 102(2)(C) of the National Environmental Policy Act [illegible] U.S. Immigration and Naturalization Service, will prepare a Programmatic Environmental Impact Statement to address operational activities conducted by the US Border Patrol Yuma and Tucson Sectors. These operations can include aerial reconnaissance, on and off-road ground patrol, drag road maintenance, and remote sensing and surveillance operations.

A public scoping meeting was previously scheduled for July 31, 2000, but has been postponed until August 8, 2000. The meeting will be conducted in Douglas, Arizona, with the purpose of identifying issues and concerns that should be addressed in the PEIS. Members of the INS Headquarters and US Border Patrol [illegible] other locations [illegible] the Tucson and Yuma Sectors' areas of operations. The location of the Douglas scoping meeting is provided below.

The meeting will take place between 7:00 p.m. (local time) and 9:00 p.m. at the Cochise College Little Theater (Building 800), Douglas Campus, Douglas, Arizona [illegible].

For more information contact either: Mr. Kevin Feeney, INS Environmental Officer (phone 202-353-9412), INS HQ, Facilities and Engineering Division, 425 I Street NW, Room 2030, Washington DC, 20536, or Mr. Joe Lamphear, INS Environmental Officer [illegible] INS [illegible] Road [illegible]

Samuel J. Pepper or Lee Knapp, having been first duly sworn, deposes and says: that The Yuma Daily Sun is a newspaper of general circulation published daily in the City of Yuma, County of Yuma, State of Arizona; that he is the publisher or business manager of said paper; that the

PUBLIC SCOPING MEETING

a printed copy of which, as it appeared in said paper, is hereto attached and made a part of this affidavit, was published in The Yuma Daily Sun

For ONE issues; that the date of the first publication of said PUBLIC SCOPING MEETING

was JULY 27 ,2000 and the date of the last publication

being JULY 27 ,2000 and that the dates when said

PUBLIC SCOPING MEETING

was printed and published in said paper were

JULY 27, 2000

Lee Knapp

Subscribed and sworn to before me, by the said Samuel J. Pepper or Lee Knapp

1st day of August, 2000

OFFICIAL SEAL
VIRGEN P. PEREZ
Notary Public State of Arizona
YUMA COUNTY
My Comm. Expires MAY 10, 2001

Virgen P. Perez Notary Public

My commission expires May 10, 2001

STAR PUBLISHING COMPANY

Tucson, Arizona

TATE OF ARIZONA)
OUNTY OF PIMA)

anice Anderson, being first duly sworn deposes and ays: that she is the Legal Advertising epresentative of the **STAR PUBLISHING COMPANY**, a orporation organized and existing under the laws f the State of Arizona, and that the said **STAR UBLISHING COMPANY** prints and publishes The Arizona aily Star, a daily newspaper printed and published n the City of Tucson, Pima County, State of rizona, and having a general circulation in said ity, County, State and elsewhere, and that the ttached

Legal Notice

as printed and published correctly in the entire ssue of the said The Arizona Daily Star on each of he following dates, to-wit:

July 18, 2000

Janice Anderson

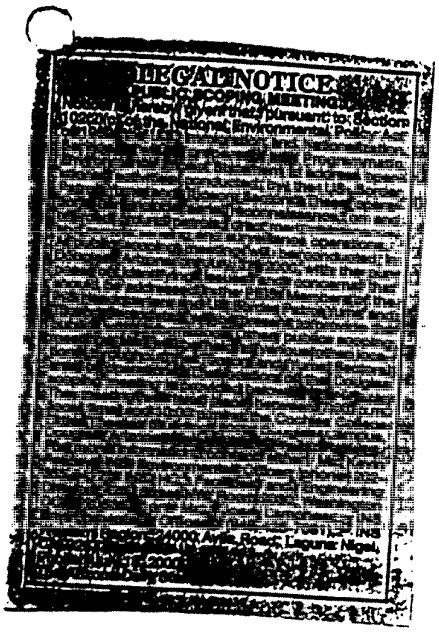
ubscribed and sworn to before me this 20th day f July, 2000

otary Public

OFFICIAL SEAL
LYNETTE J. VAN ARB
NOTARY PUBLIC - ARIZONA
PIMA COUNTY
My Comm. Expires Sept. 2, 2001

y commission expires

NI AD NO. 819333


LEGAL NOTICE

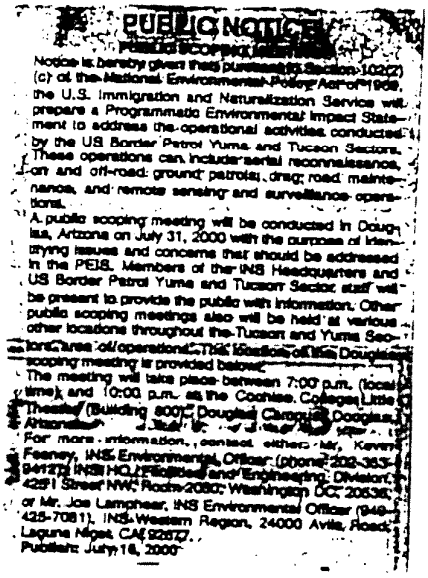
BW1 FOIA CBP 008698

AFFIDAVIT OF PUBLICATION

STATE OF ARIZONA)
:ss.
COUNTY OF COCHISE)

KIMBERLY L. MARINUS being first

duly sworn, deposes and says: That (he) (she) is the Agent to the Publisher of the SIERRA VISTA HERALD and the BISBEE DAILY REVIEW newspapers printed and published six days a week in the County of Cochise, State of Arizona, and of general circulation in the cities of Sierra Vista and Bisbee, County of Cochise, State of Arizona and elsewhere, and the hereto attached



PUBLIC NOTICE

Notice is hereby given that pursuant to Section 102(2) (c) of the National Environmental Policy Act of 1969, the U.S. Immigration and Naturalization Service will prepare a Programmatic Environmental Impact Statement to address the operational activities conducted by the US Border Patrol Yuma and Tucson Sectors. These operations can include aerial reconnaissance, on and off-road; ground patrols; drag; road maintenance, and remote sensing and surveillance operations.

A public scoping meeting will be conducted in Douglas, Arizona on July 31, 2000 with the purpose of identifying issues and concerns that should be addressed in the PEIS. Members of the INS Headquarters and US Border Patrol Yuma and Tucson Sector staff will be present to provide the public with information. Other public scoping meetings also will be held at various other locations throughout the Tucson and Yuma Sections. Dates of operational [illegible] scoping meeting is provided below:

The meeting will take place between 7:00 p.m. (local time) and 10:00 p.m. at the Cochise College Little Theater (Building 800), Douglas Campus, Douglas, Arizona.

For more information, contact either Mr. Kevin Feeney, INS Environmental Officer (phone 202-353-9412), INS HQ Facilities and Engineering Division, 425I Street NW, Room 2080, Washington DC 20536; or Mr. Joe Lamphear, INS Environmental Officer (949-425-7081), INS Western Region, 24000 Avila, Road, Laguna Niguel, CA 92677.

Publish: July 16, 2000

SCOPE MEETING-
IMPACT STATEMENT TO
ADDRESS OPERATIONAL
ACTIVITIES CONDUCTED
BY US BORDER PATROL

was printed and published correctly in the regular and entire issue of said SIERRA VISTA HERALD and BISBEE DAILY REVIEW for 1 issues, that the first was made on the 16th day of JULY 2000 and the last publication thereof was made on the 16th day of JULY 2000 that said publication was made on each of the following dates, to wit:

07/16/00

Request of GULF SOUTH RESEARCH CORP.

Sierra Vista Herald
Bisbee Daily Review

By Deborah A. Marple

Subscribed sworn to before me this 16th day of JULY 2000

OFFICIAL SEAL
DEBORAH A. MARPLE
NOTARY PUBLIC ARIZONA
COCHISE COUNTY
My Comm. Expires June 30 2001

Notary Public in and for the County of Cochise, State of Arizona

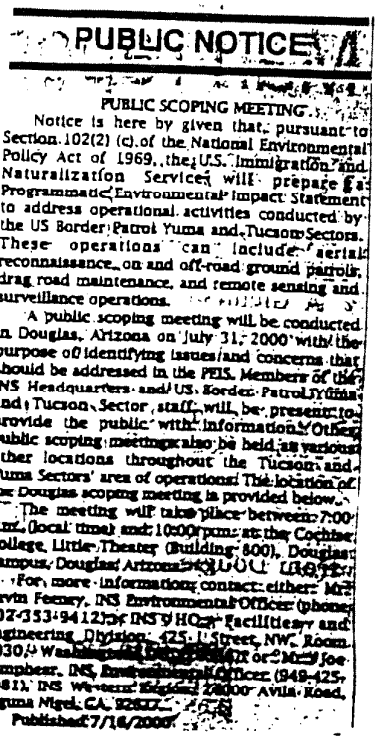
My Commission Expires: 6/30/01

The Daily Dispatch

530 11th Street, Douglas, AZ 85607 • (520) 364-3424

Monica Martinez, being first duly sworn deposes and says
that she is an agent of The Daily Dispatch, a daily newspaper, published in the City of Douglas, County of Cochise, State of Arizona: That the Notice, a copy of which is hereto attached, described as follows:

National Environmental Policy Act of 1969



PUBLIC NOTICE

PUBLIC SCOPING MEETING

Notice is here by given that, pursuant to Section 102(2) (c) of the National Environmental Policy Act of 1969, the U.S. Immigration and Naturalization Service will prepare a Programmatic Environmental Impact Statement to address operational activities conducted by the US Border Patrol Yuma and Tucson Sectors. These operations can include aerial reconnaissance, on and off-road ground patrols, drag road maintenance, and remote sensing and surveillance operations.

A public scoping meeting will be conducted in Douglas, Arizona on July 31, 2000 with the purpose of identifying issues and concerns that should be addressed in the PEIS. Members of the INS Headquarters and US Border Patrol Yuma and Tucson Sector staff will be present to provide the public with information. Other public scoping meetings also be held at various other locations throughout the Tucson and Yuma Sectors' area of operations. The location of the Douglas scoping meeting is provided below.

The meeting will take place between 7:00 p.m. (local time) and 10:00 p.m. at the Cochise College, Little Theater (Building 800), Douglas Campus, Douglas Arizona 85607.

For more information contact: either Mr. Kevin Feeney, INS Environmental Officer (phone 202-353-9412) of INS HQ's Facilities and Engineering Division, 425 I Street, NW, Room 2030, Washington DC 20536 or Mr. Joe Lamphear, INS Environmental Officer (949-425-7081), INS Western Regional Office, 24000 Avila Road, Laguna Niguel, CA 92677.

Published 7/16/2000

was published daily in the entire and regular issue of said THE DAILY DISPATCH, for

1 consecutive weeks, the FIRST publication of said notice being

_____ in the issue dated

_____, and the LAST publication being in the issue dated

July 16, 2000.

The deponent further says that the Notice was published in the newspaper proper, and not in a supplement thereof.

(SIGNED) Monica Martinez

Sworn and Subscribed to me this

18 day of

July, 2000

OFFICIAL SEAL
LAWRENCE L. BLASKEY
NOTARY PUBLIC - ARIZONA
COCHISE COUNTY
My Comm. Expires June 2, 2003

Notary Public

My commission expires: June 2, 2003

Publisher's Affidavit of Publication

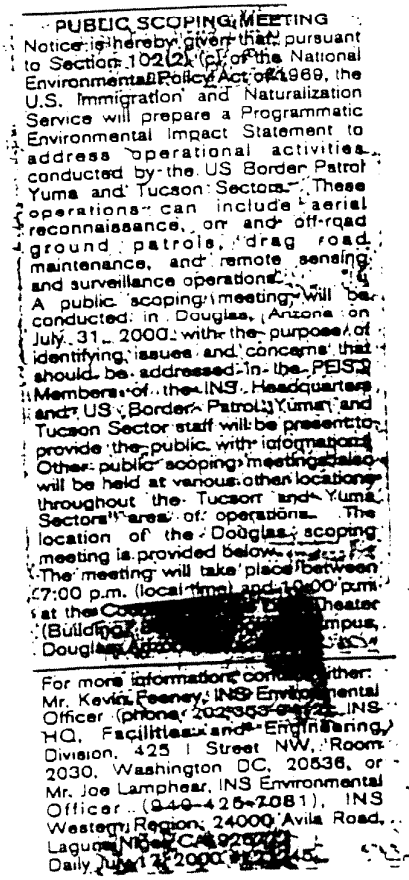
80306005

000

STATE OF ARIZONA }
COUNTY OF YUMA }

Samuel J. Pepper or Lee Knapp, having been first duly sworn, deposes and says: that The Yuma Daily Sun is a newspaper of general circulation published daily in the City of Yuma, County of Yuma, State of Arizona; that he is the publisher or business manager of said paper; that the

PUBLIC SCOPING MEETING



PUBLIC SCOPING MEETING
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A public scoping meeting will be conducted in Douglas, Arizona on July 31, 2000 with the purpose of identifying issues and concerns that should be addressed in the PEIS. Members of the INS Headquarters and US Border Patrol Yuma and Tucson Sector staff will be present to provide the public with information. Other public scoping meetings also will be held at various other locations throughout the Tucson and Yuma Sectors' areas of operations. The location of the Douglas scoping meeting is provided below. The meeting will take place between 7:00 p.m. (local time) and 10:00 p.m. at the [redacted] Theater (Building [redacted] Campus, Douglas, Arizona).
For more information contact either: Mr. Kevin Feeney, INS Environmental Officer (phone 202/353-[redacted]), INS HQ, Facilities and Engineering Division, 425 I Street NW, Room 2030, Washington DC, 20536, or Mr. Joe Lamphear, INS Environmental Officer (949-425-7081), INS Western Region, 24000 Avila Road, Laguna Niguel, CA 92677.
Daily July 17, 2000 [redacted]

a printed copy of which, as it appeared in said paper, is hereto attached and made a part of this affidavit, was published in The Yuma Daily Sun

For ONE issues; that the date of the first publication of said PUBLIC SCOPING MEETING

was JULY 17 ,2000 and the date of the last publication being JULY 17 ,2000 and that the dates when said PUBLIC SCOPING MEETING

was printed and published in said paper were

JULY 17, 2000

Lee Knapp

Subscribed and sworn to before me, by the said Samuel J. Pepper or Lee Knapp

1st day of August, 2000

Virgen P. Perez Notary Public

My commission expires May 10, 2001

PUBLIC SCOPING MEETINGS SUMMARY REPORT

Scoping meetings for the Programmatic Environmental Impact Statement (PEIS) for the U.S. Border Patrol (USBP) Tucson and Yuma Sectors were held at five locations. The following paragraphs describe the information presented to the audience and the individual comments made by the public. The summaries are divided into the locations of which these public scoping meetings were held. All general categories are included in these summary descriptions in descending order of the frequency in which they were made at each meeting. A summary list of the comments that are relevant to incorporation into the PEIS is included at the end.

SUMMARY OF SPEAKERS

A U.S. Army Corps of Engineers' representative moderated each meeting. He briefly discussed the project and introduced the various speakers for the evening. Border Patrol agents representing each sector included in this project briefly discussed problems encountered in their areas, the hazards of crossing the border, a general list of the projects anticipated for implementation within their respective sectors, and the benefits to the public for patrolling these areas. In addition, the National Environmental Policy Act (NEPA) process was discussed so that everyone attending the meeting would have a better understanding of how this project would be investigated and completed.

I Douglas, Arizona: Cochise College, Building 800, on 22 August 2000, at 7:00 p.m.

Scheduled Speakers: 4
Commenting Participants: 10

Comments Presented:

1. Concern and frustration about the confusion of the starting time of the meeting.

2. Off-road USBP traffic and environmental impacts to the desert habitat. Dragging operations are also a concern especially in sensitive areas such as the Coronado National Forest and Cabeza Prieta.

3. Concerns and opposition, in general, to the numerous on-going and possible future construction activities along the border.

4. Requests for mandatory training of the Border Patrol agents in cultural sensitivity and within the indigenous people such as the Tohono O'odham Nation.

5. Desire to de-militarize the entire border and opposition to border fences or barriers and any harassment of individuals crossing the border.

6. Numerous comments were expressed on the type of analyses that should be conducted during this study. The suggested analyses include:

    - Noise, air and water quality
    - Economic and environmental impacts
    - Archeological impacts

- Coordination and communication with the tribal nations
- The amount of radiation released from the communication devices proposed and how it will impact the wildlife
- Impacts to wildlife and individuals due to low-flying aircraft
- Specific analysis on the protected and sensitive species of the desert
- Stadium lighting effects on wildlife
- Construction of barriers or border fence impacts on wildlife corridors

7. Suggestion to conduct a public meeting in Sells, Arizona, to ensure the Tohono O'odham Nation is included in the scoping process.

8. Concerns about the format and frequency of the public notices.

9. Concern about accumulation of trash and the accusation that USBP requires apprehended aliens to leave their belongings on the ground.

10. Terminology should be politically correct (illegal, criminal, etc.) when describing the individuals apprehended while crossing the border.

II. Tucson, Arizona: Tucson Convention Center, on 3 October 2000, at 7:00 p.m.

Scheduled Speakers: 4
Commenting Participants: 34

Comments Presented:

1. Concern about stadium lighting effects on a variety of species.

2. Impacts of the barriers and surveillance equipment to be constructed and erected along the border.

3. Analysis of the cumulative impacts of all proposed border activities of INS.

4. The socioeconomic impacts of increasing the patrols along the border, as well as the effects of harassment, intimidation and apprehensions.

5. Environmental impacts of off-road vehicular use within sensitive areas in the desert.

6. Impacts to the wildlife due to aircraft noise (low-flying).

7. Addressing and disclosing all INS activities along the southwest border.

8. Addressing all alternatives fully and analysis concerning the environmental benefits of removing the Border Patrol responsibilities along the southwest border.

9. Concerns about the militarization of the border and the impacts to the residents.

10. Suggestions to better train the agents patrolling the area in human right issues and cultural sensitivity.

11. Concerns about the number of deaths that have occurred in the area of individuals attempting to cross the border and why they occurred.

12. Concerns about the format and frequency of the public notices.

13. Desire to de-militarize the entire border and opposition to border fences or barriers and any harassment of individuals crossing the border.

14. Desire to completely open the borders to anyone wanting to enter the US.

III. Nogales, Arizona: Days Inn, on 4 October 2000, at 7:00 p.m.

Scheduled Speakers: 4
Commenting Participants: 14

Comments Presented:

1. Appreciation for the Border Patrol agents protecting their land and families.

2. Increased in the quality of life within the Nogales area due to the decrease in the destruction on their private property, such as fences bordering their ranches, trash, and residence. This has assisted in the economic development of the community.

3. Discuss number of alien lives that the Border Patrol has saved while illegal aliens were trying to cross treacherous terrains.

4. Concerns of disrupting the nightly activities of nocturnal animals, some of which are sensitive or protected species.

5. Request made to better train the agents for human and civil rights, especially for people of color.

6. Concern for USBP off-road vehicular traffic within sensitive habitat areas. A number of residents noticed Border Patrol agents driving off-road on to sensitive habitat areas for protected species. It was suggested that the agents maintain their vehicles and ATVs on the established roads.

IV. Sells, Arizona: at the Legislative Council Chambers, on 5 October 2000, at 7:00 p.m.

Scheduled Speakers: 4
Commenting Participants: 6

Comments Presented:

1. Gratitude for the presence of the Border Patrol agents in the area.

2. Concerns about USBP agent training, especially cultural sensitivity. Some felt that the agents harass people within this Nation even though they may know these individuals.

3. Concerns about the format and frequency of the public notices.

4. Concerns about the speeding Border Patrol vehicles and public safety.

5. Concerns about dragging operations that have caused erosion and consequential damage to roads and fences. Concerns by the ranchers of the agents not closing the fences, or repairing the fences damaged while apprehending or patrolling the area. This allows the cattle to leave their property.

6. Concern about accumulation of trash and the accusation that USBP requires apprehended aliens to leave their belongings on the ground. It was mentioned that this problem should be resolved by the Border Patrol since they knew the "hot spots", areas where most illegal entries occur.

7. Concern and frustration about the confusion of the starting time of the meeting held in Douglas. Also concerned about the format of the meeting, particularly the five-minute time limit provided to speakers.

8. Request to conduct another series of meetings after the draft EIS is released for reviewed by the public.

9. The draft EIS should list as many alternatives as possible.

V. Yuma, Arizona: Yuma Civic and Convention Center, on 17 October 2000, at 7:00 p.m.

Scheduled Speakers: 4
Commenting Participants: 2

Comments Presented:

1. The Border Patrol and Department of Justice should be careful not to violate the Arizona Desert Wilderness Act established in the 1980s.

2. A programmatic approach should be done for the entire border concerning any NEPA studies.

3. EIS should address indirect effects of the Border Patrols concentrated efforts in urban areas which may cause illegal crossings in less developed areas of higher environmental values.

Written comments presented by Federal, state, and local agencies, organizations, and individuals are listed below:

1. The restriction of off-road vehicle use within sensitive desert areas.

2. Training the Border Patrol agents in cultural sensitivity and human rights.

3. Analyze the cumulative effects of socio-economic, environmental and environmental justice issues of the daily operations of the Border Patrol activities, as well as the ongoing actions within the Sonoran Desert.

4. Analysis on the impacts of the undocumented aliens traveling through ecologically sensitive areas, and the protection of the wilderness areas.

5. Full disclosure of all INS activities occurring along the southwest border, and the effects/benefits of removing the Border Patrol from this area.

SUMMARY OF SIGINFICANT COMMENTS AND ISSUES

The following is a list of the issues that were identified during the scoping process which is contained within the scope of the PEIS and, thus, will be addressed in the PEIS. Other comments and issues (e.g., confusion of starting time of Douglas meeting, demilitarization of the border, nationwide effects of Border Patrol activities, etc.) are beyond the scope of this PEIS and will not be addressed. These comments and issues will, of course, be identified in the public involvement section of the PEIS, but will not included in the alternatives formulation or impact analysis.

1. Impacts to desert ecosystem and cultural resources from off-road traffic and dragging operations.
2. Indirect effects of illegal immigration traffic in remote areas once urban areas are controlled.
3. Training of USBP agents in cultural sensitivity.
4. Reduction and control of trash left behind by illegal aliens.
5. Public safety concerns (vehicular speed and rescue operations).
6. Overflight impacts on wildlife, especially protected species.
7. Coordination with Native American Nations.
8. Impacts to vegetation and wildlife from lights.
9. Radiation effects of communication and other technological devices.
10. Socioeconomic benefits due to reduction in crime and trespassing.
11. Impacts to wildlife migration due to fence construction.
12. Loss of habitat due to infrastructure construction.

CORRESPONDENCE

U.S. Department of Justice
Immigration and Naturalization Service
Administrative Center Laguna

ACLFAE 10/9.3.8

24000 Avila Road
P. O. Box 30080
Laguna Niguel, CA 92607-0080

July 3, 2003

Ms. Teresa Banger
The Banger Ranch
35000 Hilton Ranch Road
Vail, Arizona 85641

VIA U.S. Mail

RE: Your Letters, dated February 18, 2003 and June 18, 2003
Programmatic Environmental Impact Statement
U.S. Border Patrol
Tucson and Yuma Sectors, Arizona

Dear Ms. Banger:

I am taking this time to respond to your second letter, dated June 18, 2003. The Department of Homeland Security (formerly Immigration and Naturalization Service) appreciates your participation with the submittal of your letter during the Public Comment period for our proposed action. The Department of Homeland Security (DHS) received a large volume of letters during the public comment period on the proposed action. All comments received from the public will be addressed in the revised draft of the Programmatic Environmental Impact Statement (PEIS). The revised draft PEIS is anticipated to be submitted for public review around the end of August 2003. Your letters will be included as part of the formal record along with DHS's analysis.

If you have any further questions or comments, please feel free to submit them in writing. Your help and comments are appreciated.

Sincerely,

Charles H. Parsons
Environmental Officer

cc: Gilbert Estrada, USBP by e-mail
Art Angulo, USBP by e-mail
Kevin Feeney, DHS by e-mail
Geraldine Pontius, DHS by e-mail
Mark Doles, USACE by U.S. Mail
Chris Ingram, GSRC by U.S. Mail

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

13 June, 2003

Public Notice

Draft Programmatic Environmental Impact Statement for US Border Patrol Activities within the Border Areas of the Tucson and Yuma Sectors, Arizona

The Department of Homeland Security (DHS) issued the subject draft programmatic environmental impact statement (DPEIS) on November 8, 2002. The review period was subsequently extended to February 2, 2003. After receiving numerous comments concerning the extent of the proposed actions, DHS re-examined the original intent of the DPEIS. It was determined that there was a variance from the original focus as defined in the Notice of Intent (NOI). In response, DHS has decided to revise the DPEIS and focus its scope to the original intent stated in the NOI. This notice is to inform the public of the revision in the DPEIS and subsequent release of a revised document in the summer of 2003.

The original intent of the scoping for the PEIS concentrated on the U.S. Border Patrol (USBP) enforcement operations conducted in the Yuma and Tucson Sectors. During the preparation of the DPEIS, various ideas for potential types of infrastructure that might be installed along the Arizona border were addressed. Many of these ideas were not based upon reality and were only conjectured plans for a USBP response to a "worst case scenario." The PEIS attempted to provide a cumulative analysis of these conceptual infrastructure plans. However, after review, it became apparent that the original intent of the PEIS (i.e., USBP Operations) was overshadowed by these conjectural infrastructure plans.

The conjectural infrastructure plans included massive constructions of roads, double-fences, lights, and monitoring equipment that were monumental in extent. The types and quantities presented in the DPEIS addressed a "worst-case scenario" and can only be thought of as having little utility except in the case of a mass invasion.

Therefore, the DHS will issue a revised DPEIS within the original scope, focusing on the USBP operations potential for impacts on the environment. Only actually planned-for infrastructure will be addressed and, will be primarily addressed in terms of its cumulative effects. The focus in the Notice of Intent (NOI) stated the DPEIS would "...address operational activities conducted by the U.S. Border Patrol, Yuma and Tucson Sectors. These operations can include aerial reconnaissance, on and off-road ground patrols, drag road maintenance, and remote sensing surveillance operations."

The revised DPEIS will again be available for a 45-day review period. A Notice of Availability will also be published in the *Federal Register* and in local and regional newspapers. Comments received during the 45-day review period will be addressed in the final PEIS. We will also provide you a copy of the DPEIS when it becomes available in the summer of 2003. If you have any questions or concerns regarding the DPEIS, please feel free to contact Mr. Mark Doles at (817) 886-1693.

Sincerely,

Paul M Hatton

for William Fickel Jr.
Chief, Planning Environmental, and Regulatory Division

JUNE 18, 2003

CHARLES PARSONS, REGIONAL
ENVIRONMENTAL OFFICER
INS WESTERN REGION
PO BOX 30080
LAGUNA NIGUEL, CA 92607-0080

RE: LETTER DATED FEBRUARY 18, 2003 - PROGAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR U.S. BORDER PATROL ACTIVITIES QWIHIN THE BORDER AREAS OF THE YUMA-TUCSON SECTORS – ARIZONA

DEAR MR PARSONS

ON FEBRUARY 18, 2003, I SENT YOU A FOUR PAGE LETTER REGARDING THE ENVIRONMENTAL IMPACT STATEMENT (SEE ABOVE) AND I HAVE NOT RECEIVED WORD FROM YOUR OFFICE WHETHER OR NOT YOU RECEIVED IT.

I WOULD LIKE TO KNOW WHAT YOU THINK OF MY COMMENTS.

THANK YOU.

SINCERELY,

TERESA BRANGER

THE BRANGER RANCH
35000 HILTON RANCH ROAD
VAIL, ARIZONA 85641

C: ENCLOSURE (4 PAGE LETTER DATED FEBRUARY 2003)

FEBRUARY 18, 2003

CHARLES PARSONS, REGIONAL
ENVIRONMENTAL OFFICER
INS WESTERN REGION
PO BOX 30080
LAGUNA NIGUEL, CA 92607-0080

DRAFT – PROGAMMATIC ENVIRONMENTAL IMPACT STATEMENT FOR U.S. BORDER PATROL ACTIVITIES WITHIN THE BORDER AREAS OF THE **YUMA-TUCSON SECTORS - ARIZONA**
++++++++++++++++++++++++++++++++
LAS CIENEGAS CONSERVATION AREA AND THE BRANGER RANCH (SEE MAP ATTACHED)

DEAR MR PARSONS

WE (MY HUSBAND, JEAN-MARCEL AND I, TERESA) I HAVE READ THE 357 PAGE DRAFT ENVIRONMENTAL IMPACT STATEMENT AND POSSIBLE SOLUTIONS TO THE UNITED STATES/MEXICAN BORDER PRIORITY ISSUE RECEIVED FRIDAY, FEBRUARY 14, 2003, VIA FEDERAL EXPRESS PRIORITY MAIL.

FIRSTLY, I WISH TO STATE THAT I HAVE ALWAYS HOPED, IN MY LIFETIME, TO WITNESS THE UNITED STATES PURCHASE MEXICO; HOWEVER, I DO NOT SEE THAT HAPPENING IN THE FORESEEABLE FUTURE.

***THE FENCING**, LIGHTING, TOWERS, ETC. PROPOSAL WOULD APPEAR THAT THE CITIZENS OF THESE UNITED STATES ARE PRISONERS IN THEIR OWN COUNTRY WITH THE USE OF SANDIA AND BOLLARD FENCING. ADMIRABLY, THE DRAFT IS AN EXCELLENT ENVIRONMENTAL STATEMENT, AND WE WHOLEHEARTEDLY AGREE THAT IT IS THE ONLY AND BEST POSSIBLE SOLUTION TO THE UIA BORDER PROBLEM.

***WE PREFER THE DECORATIVE FENCE (1-16)**

FOR THE LAST TWO YEARS, WE HAVE SUFFERED INVASION OF PRIVACY, DISRESPECT FOR OUR CONSERVATION AREAS AND PRIVATE PROPERTY, FOREIGN TRESPASSING, LACK OF SLEEP, VIOLATIONS AND EXTREME CRUELTY TO ANIMALS, AND DISGUSTING LITTER, ALL BECAUSE OF THE DRUG DEALERS/PACKERS, AND ESPECIALLY THE UIA (UNDOCUMENTED ILLEGAL ALIEN) PROBLEM IN THE EMPIRE MOUNTAINS. THESE CRIMINALS HAVE TRESPASSED ON OUR PROPERTY, (THE BRANGER RANCH), WHICH IS ADJACENT TO THE LAS CIENEGAS NATIONAL CONSERVATION AREA (42,000 ACRES), LEGISLATION INTRODUCED BY ARIZONA CONGRESSMAN JIM KOLBE AND SIGNED BY PRESIDENT CLINTON ON DECEMBER 6, 2000, AND PRESENTLY CONTROLLED AND MAINTAINED BY THE BUREAU OF LAND MANAGEMENT, TUCSON, ARIZONA.

OUR NIGHTS, AT TIMES, HAVE BEEN FILLED WITH TERRORISM CAUSED PRIMARILY BY THE DRUG DEALERS/PACKERS, , UIAS TRESPASSING, STEALING OUR WATER, HITTING OUR WINDOWS WITH THEIR STICKS AT ALL HOURS OF THE NIGHT, SHOOTING AT US AND OUR PROPERTY; DOGS, ETC., ATTEMPTING TO STEAL OUR VEHICLES, ATTACK OUR DOGS, SHOOT AT THEM, HITTING THEM WITH STICKS AND STONES, INJURING THEM AND SOMETIMES KILLING THEM.

SEVERAL TIMES LAST YEAR, OUR DOGS BARKED SO LONG, AT NIGHT, AND SO HARD THAT THEY COULD NO LONGER BARK FOR THE LONGEST TIME. I HAVE SEEN MY ANIMALS DIE BEFORE MY EYES, I HAVE SEEN WHAT THE HORRORS GUNS CAN DO, I HAVE SEEN GREAT SUFFERING FROM THEIR WOUNDS, I HAVE SEEN MY ANIMALS' FACES WITH WHIP-LIKE LASHES ON THEIR FACES, TEETH LOST FROM UIA'S HITTING THEM WITH STICKS, STONES, ETC., I CAN GO ON, BUT IT IS TOO PAINFUL AND NIGHTMARISH FOR US TO CONTINUE...

AMAZINGLY, YOUR DRAFT COVERED EVERY ISSUE AND PROBLEMS THAT WE, THE LANDOWNERS IN THE RURAL AREAS IN THE SOUTHWEST AND EASTERN PORTION OF SOUTHERN ARIZONA, HAVE EXPERIENCED, EXCEPT FOR THE ISSUE OF THE DISCARDED SARDINE CANS STREWN ABOUT LEFT IN SECRET HIDING PLACES FOR THE UIAS BY OUR OWN AMERICAN CITIZENS FACILITATING ILLEGAL BORDER CROSSERS. THERE IS NO DOUBT THAT THE WILDWIFE, ALONG WITH MY OWN ANIMALS HAVE BEEN HURT BY THEM, HENCE INJURIES AND POSSIBLE DISEASE THROUGHOUT THE ANIMAL KINGDOM IN THE EMPIRE MOUNTAINS. (WHITETAIL DEER HAVE BEEN SEEN LIMPING ALONG THE MOUNTAIN TRAILS).

MY HUSBAND, JEAN-MARCEL AND I HAVE HAD LITERALLY CLOSE TO A THOUSAND DISCUSSIONS CONCERNING SOLUTIONS TO THIS ON-GOING UGLY PROBLEM. THE ONLY SOLUTION AND LAST RESORT WAS BORDER

FENCING. WE PERSONALLY DISCUSSED ELECTRICAL FENCING SURROUNDING OUR OWN PROPERTY , BUT IT WOULD DEFINITELY EFFECT THE WILDLIFE'S FREEDOM TO ROAM, IN MORE WAYS THAN ONE, SO CONSEQUENTLY THAT SOLUTION WAS QUICKLY RULED OUT.

TO DATE, UIAS CONTINUE DAILY TO CROSS OVER THE LAS CIENEGAS NATIONAL CONSERVATION AREA, THROUGH OUR PROPERTY, AND ONTO HIGHWAY 83, HEADED FOR TUCSON **(SEE MAP ATTACHED)**. WE ESTIMATE FIVE, EIGHT AND SOMETIMES 15 UIAS CROSS OUR PROPERTY IN THE LATE EVENING AND EARLY MORNING DAILY, BUT SURPRISINGLY, WHEN THE "VIGILANTE STORY" CAME OUT IN THE ARIZONA DAILY STAR, AND ON TELEVISION, THEY QUICKLY CEASED FROM TRESPASSING, STEALING OUR WATER, TERRORIZING US, AND ARE NOW CROSSING AS QUIETLY AS THEY KNOW HOW. HOWEVER, MY ANIMALS CONTINUE TO SUFFER AT THE HANDS OF THESE CRIMINALS.

OUR HEARTS ARE HEAVILY LADEN WITH THE THOUGHT OF A BORDER FENCE GOING UP ALONG THE ARIZONA BORDER, BUT IT IS THE ONLY POSSIBLE SOLUTION, BESIDES THE SOLUTION OF THESE UNITED STATES PURCHASING MEXICO.

THANK YOU FOR READING OUR COMMENTS TO THE ENVIRONMENTAL IMPACT STATEMENT FOR U.S. BORDER PATROL ACTIVITIES WITHIN THE BORDER AREAS OF THE TUCSON AND YUMA SECTORS.

PLEASE FEEL FREE TO CALL ON US TO ASSIST IN ANY WAY THAT WE POSSIBLY CAN, SO THAT U.S. BORDER PATROL CAN SUCCESSFULLY ACCOMPLISH THEIR GOALS IN PEACE.

AGAIN, THANK YOU.

RESPECTFULLY SUBMITTED,

JEAN MARCEL BRANGER

TERESA BRANGER, LANDOWNERS

THE BRANGER RANCH
THE EMPIRE MOUNTAINS
35000 HILTON RANCH ROAD
VAIL, ARIZONA 85641

COPIES TO:

CONGRESSMAN JIM KOLBE *THANK YOU FOR THE LAS CIENEGAS C.A.
1661 NORTH SWAN, STE 112
TUCSON, ARIZONA 85712

BUREAU OF LAND MANAGEMENT
TUCSON SECTOR
ATTN JESSE JUEN * THANK YOU FOR BEING THERE.
12661 EAST BROADWAY
TUCSON, ARIZONA 85748-7208

U.S. BORDER PATROL
ATTN: CLYDE BENZENHOEFER *THANK YOU FOR ALL YOUR HELP!
2430 SOUTH SWAN ROAD
TUCSON, ARIZONA 85711 HAND DELIVERED MONDAY, 2/24/2003

OFFICE OF CONGRESSMAN ED PASTOR
ATTN LANDIS DAVID
2432 EAST BROADWAY BLVDF
TUCSON, ARIZONA 85719

END OF LIST.

Notice of Availability
Draft Programmatic Environmental Impact Statement
for U.S. Border Patrol Activities Within the Border Areas of the
Tucson And Yuma Sectors, Arizona

AGENCY: U.S. Immigration and Naturalization Service
Headquarters, Facilities and Engineering Division
Washington, DC

ACTION: Notice of Availability of the Draft Programmatic Environmental Impact Statement

SUMMARY: This Notice has been prepared to inform interested parties that the Immigration and Naturalization Service has released the Draft Programmatic Environmental Impact Statement (DPEIS) for INS and U.S. Border Patrol daily operations (*i.e.*, ground and aerial patrols, maintenance of drag roads, lighting, remote video surveillance (RVS) systems, and checkpoint operations) within the Tucson and Yuma (Arizona portion) Sectors. The DPEIS also addresses the potential effects of known or reasonably foreseeable infrastructure construction projects (*i.e.*, fences, bridges, stations, and lighting). Comments received during the public review period will be incorporated, as appropriate, into the final PEIS.

DATES: Written comments and suggestions must be received no later than 45 days after the U.S. Environmental Protection Agency posts the notice of availability in the *Federal Register*, which is expected to occur on 1 November 2002.

ADDRESSES: Copies of the DPEIS are available for review at the following libraries: Douglas library, 560 E. 10th Street, Douglas, AZ; Nogales City-Santa Cruz Library, Nogales Place, 518 North Grand Avenue, Nogales, AZ; Casa Grande Public Library, 405 East Sixth, Casa Grande, AZ; Yuma County Library, 350 Third Avenue, Yuma, AZ; Yuma County Library, Wellton Branch, 10425 William Street, Wellton, AZ; Pima Community College, West Campus Learning Resource Center, Tucson, AZ; University of Arizona Library, 1040 East Fourth Street, Tucson, AZ; Cochise College, Andrea Cracchiolo Library, 901 North Colombo, Sierra Vista, AZ; Tucson-Pima Library, 101 North Stone Avenue, Tucson, AZ; Copper Queen Library, 6 Main Street, Bisbee, AZ; Elsie S. Hogan, Community Library, 207 W. Maley, Willcox, AZ; Tucson-Pima County Community Library, 33 Plaza, Ajo, AZ.

Paper and/or electronic copies (CD-ROM) of the DPEIS can also be obtained by writing to Mr. Charles McGregor, U.S. Army Corps of Engineers, Fort Worth District, ATTN: CESWF-PER-EE, P.O. Box 17300, Fort Worth, Texas 76102-0300.

Send written comments on the DPEIS to Mr. Charles McGregor, at the address listed above or fax comments to Mr. McGregor's attention at (817) 886-6499. Electronically transmitted comments will not be accepted. Mr. McGregor can be contacted for additional information at (817) 886-1708.

U.S. Department of Justice
Immigration and Naturalization Service
Architect-Engineer Resource Center

Attention: CESWF-PM-INS
819 Taylor Street, Room 3A28
P.O. Box 17300
Fort Worth, TX 76102-0300

October 29, 2002

Dear Sir or Madam:

The Immigration and Naturalization Service (INS) has prepared a Draft Programmatic Environmental Impact Statement (DPEIS). The DPEIS addresses potential impacts of U.S. Border Patrol (USBP) daily operations (i.e., ground and aerial patrols, maintenance of drag roads, lighting, off-road patrols, and checkpoints) for the Tucson and Yuma (Arizona portion) Sectors in Arizona. The DPEIS also addresses the potential effects of known or reasonably foreseeable infrastructure construction projects (i.e., fences, bridges, stations, and lighting).

The INS is soliciting comments on the DPEIS from Federal and state agencies, organizations and the general public. Enclosed please find a CD with an electronic copy of the DPEIS in Adobe format (.pdf). Hardcopies and electronic copies of the DPEIS have been distributed to local and regional libraries and are available for review and downloading from the USACE, Fort Worth District's Internet web page at the following url address: www.swf.usace.army.mil/ins/peis/default.htm. Hardcopies of the DPEIS are also available upon request by contacting Mr. Charles McGregor, USACE Fort Worth District, at (817) 886-1708. Written comments can be sent to Mr. Charles McGregor, USACE Fort Worth District, ATTN: CESWF-PER-EE, P.O. Box 17300, Fort Worth, Texas 76102-0300 or faxed to Mr. McGregor's attention at (817) 886-6499. The deadline for receipt of comments is 45 days after the notice of availability has been published in the *Federal Register*, which is expected to occur on 1 November 2002.

If you have any questions, please call Mr. McGregor at (817) 886-1708.

Sincerely,

Eric W. Verwers

Eric W. Verwers
Director, INS A-E Resource Center

Enclosure

STATE OF ARIZONA)
:ss.
COUNTY OF COCHISE)

AFFIDAVIT OF PUBLICATION

KIMBERLY L. MARINUS being first duly sworn, deposes and says: That (he) (she) is the Agent to the Publisher of the SIERRA VISTA HERALD and the BISBEE DAILY REVIEW newspapers printed and published six days a week in the County of Cochise, State of Arizona, and of general circulation in the cities of Sierra Vista and Bisbee, County of Cochise, State of Arizona and elsewhere, and the hereto attached

NOTICE OF AVAILABIL-
ITY ENVIRONMENTAL
IMPACT STATEMENT FOR
US BORDER PATROL
ACTIVITIES

was printed and published correctly in the regular and entire issue of said SIERRA VISTA HERALD and BISBEE DAILY REVIEW for 1 issues, that the first was made on the 1st day of NOVEMBER 20 02 and the last publication thereof was made on the 1st day of NOVEMBER 20 02 that said publication was made on each of the following dates, to wit:

11/01/02

PUBLIC NOTICE

Notice of Availability
Draft Programmatic Environmental Impact Statement
for U.S. Border Patrol Activities Within the Border Areas of the Tucson And Yuma Sectors, Arizona

AGENCY: U.S. Immigration and Naturalization Service Headquarters, Facilities and Engineering Division Washington, DC

ACTION: Notice of Availability of the Draft Programmatic Environmental Impact Statement

SUMMARY: This Notice has been prepared to inform interested parties that the Immigration and Naturalization Service has released the Draft Programmatic Environmental Impact Statement (DPEIS) for INS and U.S. Border Patrol daily operations (i.e., ground and aerial patrols, maintenance of drag roads, lighting, remote video surveillance (RVS) systems, and checkpoint operations) within the Tucson and Yuma (Arizona portion) Sectors. The DPEIS also addresses the potential effects of known or reasonably foreseeable infrastructure construction projects (i.e., fences, bridges, stations, and lighting). Comments received during the public review period will be incorporated, as appropriate, into the final PEIS.

DATES: Written comments and suggestions must be received no later than 45 days after the U.S. Environmental Protection Agency posts the notice of availability in the Federal Register, which is expected to occur on 1 November 2002.

ADDRESSES: Copies of the DPEIS are available for review at the following libraries: Douglas Library, 560 E. 10th Street, Douglas, AZ; Nogales City-Santa Cruz Library, Nogales Place, 518 North Grand Avenue, Nogales, AZ; Casa Grande Public Library, 405 East Birch, Casa Grande, AZ; Yuma County Library, 350 Third Avenue, Yuma, AZ; Yuma County Library, Welton Branch, 13426 Wilson Street, Welton, AZ; Pima Community College, West Campus Learning Resource Center, Tucson, AZ; University of Arizona Library, 1040 East Fourth Street, Tucson, AZ; Cochise College, Andres Cracchiolo Library, 901 North Colombo, Sierra Vista, AZ; Tucson-Pima Library, 101 North Stone Avenue, Tucson, AZ; Copper Queen Library, 6 Main Street, Bisbee, AZ; Elsie S. Hogan Community Library, 207 W. Maley, Willcox, AZ; Tucson-Pima County Community Library, 88 Plaza, Ajo, AZ.

Paper and/or electronic copies (CD-ROM) of the DPEIS can also be obtained by writing to Mr. Charles McGregor, U.S. Army Corps of Engineers, Fort Worth District, ATTN: CESWF-PER-EE, P.O. Box 17300, Fort Worth, Texas 76102-0300.

Send written comments on the DPEIS to Mr. Charles McGregor, at the address listed above or fax comments to Mr. McGregor's attention at (817) 886-6499. Electronically transmitted comments will not be accepted. Mr. McGregor can be contacted for additional information at (817) 886-1708.

PUBLISH: November 1, 2002

Request of GULF SOUTH RESEARCH CORP.

Sierra Vista Herald
Bisbee Daily Review

By

Subscribed sworn to before me this 1st day of NOVEMBER 20 02

OFFICIAL SEAL
JOAN HANCOCK
Notary Public - Arizona
COCHISE COUNTY
My Comm Exp 5/21/2004

Notary Public in and for the County of Cochise, State of Arizona

My Commission Expires: 5/21/2004

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

REPLY TO
ATTENTION OF:

November 5, 2002

Planning, Environmental and Regulatory Division

SUBJECT: Immigration and Naturalization Service (INS) Draft Programmatic Environmental Impact Statement (DPEIS) for U.S. Border Patrol Activities Within the Border Areas of the Tucson and Yuma Sectors

Honorable Delia Carlyle, Chairperson
Ak Chin Indian Community Council
42507 W. Peters & Nall Road
Maricopa, AZ 85239

Dear Chairperson Carlyle:

In accordance with Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR Part 800.3, the Fort Worth District of the US Army Corps of Engineers, acting on behalf of the Immigration and Naturalization Service (INS) and the U.S. Border Patrol (USBP), is pleased to provide you with this copy of the DPEIS mentioned above.

In accordance with federal laws and regulations in conducting these investigations, we wish to continue our on-going consultation with the appropriate federally recognized Native American tribes who historically used this region or continue to use the area.

The DPEIS addresses potential impacts of U.S. Border Patrol (USBP) daily operations (i.e., ground and aerial patrols, maintenance of drag roads, lighting, off-road patrols, and checkpoints) for the Tucson and Yuma (Arizona portion) Sectors in Arizona. The DPEIS also addresses the potential effects of known or reasonably foreseeable infrastructure construction projects (i.e., fences, bridges, stations, and lighting).

We welcome your comments on this public document and look forward to hearing from you. The deadline for receipt of comments is 45 days after the notice of availability has been published in the Federal Register, November 1, 2002. Written comments can be sent to Mr. Charles McGregor, or Ms. Patience Patterson, USACE Fort Worth District, ATTN: CESWF-PER-EE, at the address noted above.

If you require additional information or have any questions, you may contact Ms. Patience Patterson at (817) 886-1723. Thank you for your assistance with this public document.

Sincerely,

William Fickel, Jr.
Chief, Planning, Environmental
and Regulatory Division

Enclosure

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

REPLY TO
ATTENTION OF:

November 5, 2002

Planning, Environmental and Regulatory Division

SUBJECT: Immigration and Naturalization Service (INS) Draft Programmatic Environmental Impact Statement (DPEIS) for U.S. Border Patrol Activities Within the Border Areas of the Tucson and Yuma Sectors

Honorable Donald R. Antone, Governor
Gila River Indian Community Council
P.O. Box 97
Sacaton, AZ 85247

Dear Governor Antone:

In accordance with Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR Part 800.3, the Fort Worth District of the US Army Corps of Engineers, acting on behalf of the Immigration and Naturalization Service (INS) and the U.S. Border Patrol (USBP), is pleased to provide you with this copy of the DPEIS mentioned above.

In accordance with federal laws and regulations in conducting these investigations, we wish to continue our on-going consultation with the appropriate federally recognized Native American tribes who historically used this region or continue to use the area.

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We welcome your comments on this public document and look forward to hearing from you. The deadline for receipt of comments is 45 days after the notice of availability has been published in the Federal Register, November 1, 2002. Written comments can be sent to Mr. Charles McGregor, or Ms. Patience Patterson, USACE Fort Worth District, ATTN: CESWF-PER-EE, at the address noted above.

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

REPLY TO
ATTENTION OF:

November 5, 2002

Planning, Environmental and Regulatory Division

SUBJECT: Immigration and Naturalization Service (INS) Draft Programmatic Environmental Impact Statement (DPEIS) for U.S. Border Patrol Activities Within the Border Areas of the Tucson and Yuma Sectors

Honorable Sherry Cordova, Chairperson
Cocopah Indian Tribe
County 15th and Avenue G
Somerton, AZ 85350

Dear Chairperson Cordova:

In accordance with Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR Part 800.3, the Fort Worth District of the US Army Corps of Engineers, acting on behalf of the Immigration and Naturalization Service (INS) and the U.S. Border Patrol (USBP), is pleased to provide you with this copy of the DPEIS mentioned above.

In accordance with federal laws and regulations in conducting these investigations, we wish to continue our on-going consultation with the appropriate federally recognized Native American tribes who historically used this region or continue to use the area.

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We welcome your comments on this public document and look forward to hearing from you. The deadline for receipt of comments is 45 days after the notice of availability has been published in the Federal Register, November 1, 2002. Written comments can be sent to Mr. Charles McGregor, or Ms. Patience Patterson, USACE Fort Worth District, ATTN: CESWF-PER-EE, at the address noted above.

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

REPLY TO
ATTENTION OF:

November 5, 2002

Planning, Environmental and Regulatory Division

SUBJECT: Immigration and Naturalization Service (INS) Draft Programmatic Environmental Impact Statement (DPEIS) for U.S. Border Patrol Activities Within the Border Areas of the Tucson and Yuma Sectors

Honorable Daniel Eddy, Jr., Chairperson
Colorado River Indian Tribes
Route 1, Box 23-B
Parker, Arizona 85344

Dear Chairperson Eddy:

In accordance with Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR Part 800.3, the Fort Worth District of the US Army Corps of Engineers, acting on behalf of the Immigration and Naturalization Service (INS) and the U.S. Border Patrol (USBP), is pleased to provide you with this copy of the DPEIS mentioned above.

In accordance with federal laws and regulations in conducting these investigations, we wish to continue our on-going consultation with the appropriate federally recognized Native American tribes who historically used this region or continue to use the area.

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We welcome your comments on this public document and look forward to hearing from you. The deadline for receipt of comments is 45 days after the notice of availability has been published in the Federal Register, November 1, 2002. Written comments can be sent to Mr. Charles McGregor, or Ms. Patience Patterson, USACE Fort Worth District, ATTN: CESWF-PER-EE, at the address noted above.

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

REPLY TO
ATTENTION OF:

November 5, 2002

Planning, Environmental and Regulatory Division

SUBJECT: Immigration and Naturalization Service (INS) Draft Programmatic Environmental Impact Statement (DPEIS) for U.S. Border Patrol Activities Within the Border Areas of the Tucson and Yuma Sectors

Honorable Ivan Makil, President
Salt River Pima-Maricopa Indian Community Council
10005 E. Osborn
Scottsdale, AZ 85256

Dear President Makil:

In accordance with Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR Part 800.3, the Fort Worth District of the US Army Corps of Engineers, acting on behalf of the Immigration and Naturalization Service (INS) and the U.S. Border Patrol (USBP), is pleased to provide you with this copy of the DPEIS mentioned above.

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We welcome your comments on this public document and look forward to hearing from you. The deadline for receipt of comments is 45 days after the notice of availability has been published in the Federal Register, November 1, 2002. Written comments can be sent to Mr. Charles McGregor, or Ms. Patience Patterson, USACE Fort Worth District, ATTN: CESWF-PER-EE, at the address noted above.

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

REPLY TO
ATTENTION OF:

November 5, 2002

Planning, Environmental and Regulatory Division

SUBJECT: Immigration and Naturalization Service (INS) Draft Programmatic Environmental Impact Statement (DPEIS) for U.S. Border Patrol Activities Within the Border Areas of the Tucson and Yuma Sectors

Honorable Wayne Taylor, Jr., Chairman
ATTN: Mr. Leigh J. Kuwanwisiwma
Hopi Tribal Council
P.O. Box 123
Kykotsmovi, AZ 86039

Dear Chairman Taylor:

In accordance with Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR Part 800.3, the Fort Worth District of the US Army Corps of Engineers, acting on behalf of the Immigration and Naturalization Service (INS) and the U.S. Border Patrol (USBP), is pleased to provide you with this copy of the DPEIS mentioned above.

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We welcome your comments on this public document and look forward to hearing from you. The deadline for receipt of comments is 45 days after the notice of availability has been published in the Federal Register, November 1, 2002. Written comments can be sent to Mr. Charles McGregor, or Ms. Patience Patterson, USACE Fort Worth District, ATTN: CESWF-PER-EE, at the address noted above.

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

REPLY TO
ATTENTION OF:

November 5, 2002

Planning, Environmental and Regulatory Division

SUBJECT: Immigration and Naturalization Service (INS) Draft Programmatic Environmental Impact Statement (DPEIS) for U.S. Border Patrol Activities Within the Border Areas of the Tucson and Yuma Sectors

Honorable Mike Jackson, Sr., President
Quechan Tribe
350 Picacho Rd.
Winterhaven, CA 92283

Dear President Jackson:

In accordance with Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR Part 800.3, the Fort Worth District of the US Army Corps of Engineers, acting on behalf of the Immigration and Naturalization Service (INS) and the U.S. Border Patrol (USBP), is pleased to provide you with this copy of the DPEIS mentioned above.

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DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

REPLY TO
ATTENTION OF:

November 5, 2002

Planning, Environmental and Regulatory Division

SUBJECT: Immigration and Naturalization Service (INS) Draft Programmatic Environmental Impact Statement (DPEIS) for U.S. Border Patrol Activities Within the Border Areas of the Tucson and Yuma Sectors

Honorable Edward Manuel, Chairman
ATTN: Mr. Peter Steere, Cultural Resource Manager
Tohono O'odham Nation
P.O. Box 837
Sells, AZ 85634

Dear Chairman Manuel:

In accordance with Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR Part 800.3, the Fort Worth District of the US Army Corps of Engineers, acting on behalf of the Immigration and Naturalization Service (INS) and the U.S. Border Patrol (USBP), is pleased to provide you with this copy of the DPEIS mentioned above.

In accordance with federal laws and regulations in conducting these investigations, we wish to continue our on-going consultation with the appropriate federally recognized Native American tribes who historically used this region or continue to use the area.

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DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

REPLY TO
ATTENTION OF:

November 5, 2002

Planning, Environmental and Regulatory Division

SUBJECT: Immigration and Naturalization Service (INS) Draft Programmatic Environmental Impact Statement (DPEIS) for U.S. Border Patrol Activities Within the Border Areas of the Tucson and Yuma Sectors

Honorable Stan Rice, President
Yavapai-Prescott Tribe
530 East Merritt Street
Prescott, AZ 86301

Dear President Rice:

In accordance with Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR Part 800.3, the Fort Worth District of the US Army Corps of Engineers, acting on behalf of the Immigration and Naturalization Service (INS) and the U.S. Border Patrol (USBP), is pleased to provide you with this copy of the DPEIS mentioned above.

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DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

REPLY TO
ATTENTION OF:

November 5, 2002

Planning, Environmental and Regulatory Division

SUBJECT: Immigration and Naturalization Service (INS) Draft Programmatic Environmental Impact Statement (DPEIS) for U.S. Border Patrol Activities Within the Border Areas of the Tucson and Yuma Sectors

Honorable Vincent Randall, Chairman
Yavapai-Apache Community Council
P.O. Box 1188
Camp Verde, AZ 86322

Dear Chairman Randall:

In accordance with Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR Part 800.3, the Fort Worth District of the US Army Corps of Engineers, acting on behalf of the Immigration and Naturalization Service (INS) and the U.S. Border Patrol (USBP), is pleased to provide you with this copy of the DPEIS mentioned above.

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DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

REPLY TO
ATTENTION OF:

November 5, 2002

Planning, Environmental and Regulatory Division

SUBJECT: Immigration and Naturalization Service (INS) Draft Programmatic Environmental Impact Statement (DPEIS) for U.S. Border Patrol Activities Within the Border Areas of the Tucson and Yuma Sectors

Honorable Malcolm Bowekaty, Governor
Zuni Pueblo Tribal Council
P.O. Box 339
Zuni, NM 87327

Dear Governor Bowekaty:

In accordance with Section 106 of the National Historic Preservation Act and its implementing regulations, 36 CFR Part 800.3, the Fort Worth District of the US Army Corps of Engineers, acting on behalf of the Immigration and Naturalization Service (INS) and the U.S. Border Patrol (USBP), is pleased to provide you with this copy of the DPEIS mentioned above.

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U.S. Department of Justice
Immigration and Naturalization Service
Architect-Engineer Resource Center

Attention: CESWF-PM-INS
819 Taylor Street, Room 3A28
P.O. Box 17300
Fort Worth, TX 76102-0300

October 20, 2000

U.S. Fish and Wildlife Service
ATTN: Pete Sorensen
2730 Loker Avenue West
Carlsbad, CA 92008

Dear Mr. Sorensen,

The Immigration and Naturalization Service (INS) intends to prepare an Environmental Impact Statement (EIS) addressing U.S. Border Patrol (USBP) activities along the U.S.-Mexico Border in Arizona and a portion of California. We are currently in the process of gathering the most current information available regarding Federally listed species potentially occurring within the project area.

INS would like to formally request a current list of Federally protected species potentially occurring in Imperial County. Any information you may have regarding critical habitat areas for these species would also be greatly appreciated. To better assess potential impacts to these species, we would like to present as much data in a GIS format as possible. Any GIS information, or information sources, you could provide regarding current distribution of the protected species would also be very helpful.

If you have any questions, or require additional information, please contact me at (817) 978-0202. Thank you for your prompt attention and cooperation.

Sincerely,

Eric Verwers, Assistant Director
Immigration and Naturalization Service,
A/E Resource Center

U.S. Department of Justice
Immigration and Naturalization Service
Architect-Engineer Resource Center

Attention: CESWF-PM-INS
819 Taylor Street, Room 3A28
P.O. Box 17300
Fort Worth, TX 76102-0300

September 28, 2000

U.S. Fish and Wildlife Service
ATTN: Dave Harlow
2321 W. Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951

Dear Mr. Harlow,

The Immigration and Naturalization Service (INS) intends to prepare an Environmental Impact Statement (EIS) addressing U.S. Border Patrol (USBP) activities along the U.S.-Mexico Border in Arizona. We are currently in the process of gathering the most current information available regarding Federally listed species potentially occurring within the USBP Tucson and Yuma Sectors. Operational activities of the Tucson Sector are concentrated in Cochise, Pima, Yuma, and Santa Cruz counties of Arizona.

A current list of Federally threatened or endangered species that potentially occur in these counties is included as attachment A. Please review this list for accuracy and completeness. Any information you may have regarding potential or known presence, critical habitat, general habitat, descriptions, distribution, and status of these species would be greatly appreciated. To better assess potential impacts to these species, we would like to present as much data in a GIS format as possible. Any GIS information, or information sources, you could provide regarding current distribution of the above mentioned species would also be appreciated. Additionally, any past Biological Opinions prepared by the USFWS for these species would be very helpful.

We look forward to working with you on this project. If you have any questions, or require additional information, please contact me at (817) 978-0202. Thank you for your prompt attention and cooperation.

Sincerely,

Eric Verwers, Assistant Director
Immigration and Naturalization Service
A/E Resource Center

Threatened and Endangered Species
Listing by County in southern Arizona
(Tucson and Yuma USBP Sectors)

Common Name	Scientific Name	Listing Status	County
Beautiful shiner	*Cyprinella formosa*	Threatened	Cochise
Canelo Hills ladies'tresses	*Spiranthes delitescens*	Endangered	Cochise, Santa Cruz
Cochise pincushion cactus	*Coryphantha robbinsorum*	Threatened	Cochise
Desert pupfish	*Cyprinodon macularius*	Endangered	Santa Cruz, Pima
Gila topminnow	*Poeciliopsis occidentalis occidentales*	Endangered	Cochise, Santa Cruz, Pima
Huachuca water umbel	*Lilaeopsis schaffneriana recurva*	Endangered	Cochise, Santa Cruz, Pima
Jaguar	*Panthera onca*	Endangered	Cochise, Santa Cruz, Pima
Jaguarundi	*Felis yagouaroundi cacomitli*	Endangered	Cochise, Santa Cruz, Pima
Kearney's blue star	*Amsonia kearneyana*	Endangered	Pima
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	Endangered	Cochise, Santa Cruz, Pima
Masked bobwhite	*Colinus virginianus ridgwayi*	Endangered	Pima
Mexican spotted owl	*Strix occidentalis lucida*	Threatened	Cochise, Santa Cruz, Pima
New Mexico ridge-nosed rattlesnake	*Crotalus willardi obscurus*	Threatened	Cochise
Nichol's Turk's head cactus	*Echinocactus horizonthalonius nicholii*	Endangered	Pima, Yuma
Northern aplomado falcon	*Falco femoralis septentrionalis*	Endangered	Cochise, Santa Cruz
Ocelot	*Felis pardalis*	Endangered	Cochise, Santa Cruz, Pima
Pima pineapple cactus	*Coryphantha scheeri robustispina*	Endangered	Santa Cruz, Pima
Razorback sucker	*Xyrauchen texanus*	Endangered	Yuma
San Xavier talussnail	*Sonorella eremita*	Species of Concern	Pima
Sonora tiger salamander	*Ambystoma tigrinum stebbinsi*	Endangered	Cochise, Santa Cruz
Sonoran pronghorn	*Antilocapra americana sonoriensis*	Endangered	Pima, Yuma
Southwestern willow flycatcher	*Empidonax traillii extimus*	Endangered	Cochise, Santa Cruz, Pima, Yuma
Yaqui catfish	*Ictalurus pricei*	Threatened	Cochise
Yaqui chub	*Gila purpurea*	Endangered	Cochise
Yuma clapper rail	*Rallus longirostris yumanensis*	Endangered	Yuma

U.S. Department of Justice
Immigration and Naturalization Service
Architect-Engineer Resource Center

Attention: CESWF-PM-INS
819 Taylor Street, Room 3A28
P.O. Box 17300
Fort Worth, TX 76102-0300

September 28, 2000

U.S. Department of Agriculture
Tucson Office
Plant Services Division
400 W. Congress, Suite 124
Tucson, AZ 85710

To Whom It May Concern:

The Immigration and Naturalization Service (INS) intends to prepare an Environmental Impact Statement (EIS) addressing U.S. Border Patrol (USBP) activities along the U.S.-Mexico Border in Arizona. We are currently in the process of gathering the most current information available regarding Federally listed species potentially occurring within the USBP Tucson and Yuma Sectors. Operational activities of the Tucson Sector are concentrated in Cochise, Pima, Yuma, and Santa Cruz counties of Arizona.

The INS AERC respectfully requests that your agency provide a list and/or description of the native plants that you believe may be affected by the USBP activities in this area. We intend to provide your agency with a copy of the Draft EIS once it is completed. Please inform us if additional copies are needed and/or if someone else within your agency other than you should receive the Draft EIS.

We look forward to working with you on this project. If you have any questions, or require additional information, please contact me at (817) 978-0202. Thank you for your prompt attention and cooperation.

Sincerely,

Eric Verwers, Assistant Director
Immigration and Naturalization Service
A/E Resource Center

U.S. Department of Justice
Immigration and Naturalization Service
Architect-Engineer Resource Center

Attention: CESWF-PM-INS
819 Taylor Street, Room 3A28
P.O. Box 17300
Fort Worth, TX 76102-0300

September 28, 2000

Arizona Game and Fish Department
ATTN: John Hervert
9140 E. County 10½ Street
Yuma, Arizona 85365

Dear Mr. Hervert,

The Immigration and Naturalization Service (INS) intends to prepare an Environmental Impact Statement (EIS) addressing U.S. Border Patrol (USBP) activities along the U.S.-Mexico Border in Arizona. We are currently in the process of gathering the most current information available regarding Federally listed species potentially occurring within the USBP Tucson and Yuma Sectors. Operational activities of the Tucson Sector are concentrated in Cochise, Pima, Yuma, and Santa Cruz counties of Arizona.

A current list of Federally threatened or endangered species that potentially occur in these counties is included as attachment A. Please review this list for accuracy and completeness. Any information you may have regarding potential or known presence, critical habitat, general habitat, descriptions, distribution, and status of these species would be greatly appreciated. To better assess potential impacts to these species, we would like to present as much data in a GIS format as possible. Any GIS information, or information sources, you could provide regarding current distribution of the above mentioned species would also be appreciated. Additionally, any past Biological Opinions prepared by the USFWS for these species would be very helpful.

We look forward to working with you on this project. If you have any questions, or require additional information, please contact me at (817) 978-0202. Thank you for your prompt attention and cooperation.

Sincerely,

Eric Verwers, Assistant Director
Immigration and Naturalization Service
A/E Resource Center

GSRC | GULF SOUTH RESEARCH CORPORATION
Post Office Box 83564 Baton Rouge, Louisiana 70884-3564 Telephone (225) 757-8088

22 April 1999

Sabra Schwartz
Heritage Data Management System Coordinator
Arizona Game and Fish Department

Dear Ms. Schwartz,

As I mentioned on the phone, the Immigration and Naturalization Service (INS) intends to prepare a Biological Assessment (BA) addressing U.S. Border Patrol (USBP) activities along the U.S.-Mexico Border in Southeast Arizona. Operational activities of the USBP occur in Cochise, Pima, Pinal, and Santa Cruz Counties of Arizona. Preliminary discussions with U.S. Fish and Wildlife (USFWS) personnel indicate that the BA should focus on four species within the area: Sonoran Pronghorn (*Antilocapra americana sonoriensis*), Cochise pincushion cactus (*Coryphantha robbinsorum*), American peregrine falcon (*Falco peregrinus anatum*), and Mexican spotted owl (*Strix occidentalis lucida*).

We are currently in the process of gathering the most current information available regarding protected species within the counties of Cochise, Pima, Pinal, and Santa Cruz. As we discussed this afternoon, we would like your office to provide a preliminary distribution map of the four species within the four county project study area (The INS BA is still in the preliminary stages and detailed species locations are not required). Additionally, any general information you may have about the four species would be greatly appreciated. I realize that you normally require 30 days to process this type of information, but if possible we would like to have this information available for an upcoming meeting with the USFWS. The meeting will probably occur the week of May 10, 1999. If possible, we would like to receive your information by May 5, 1999 in order to allow our GIS department time to digitize the map information before the meeting.

We look forward to working with you on this project. Please don't hesitate to contact me if you have any questions or require additional information.

Sincerely,

Stephen Smith

ref: 80511104

DEPARTMENT OF THE ARMY
FORT WORTH DISTRICT, CORPS OF ENGINEERS
P. O. BOX 17300
FORT WORTH, TEXAS 76102-0300

REPLY TO
ATTENTION OF:

February 22, 1999

Environmental Division

U.S. Fish and Wildlife Service
ATTN: Dave Harlow
2321 W. Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951

Dear Mr. Harlow:

The U.S. Army Corps of Engineers, Fort Worth District (USACE) is assisting the Immigration and Naturalization Service (INS) with preparation of a Biological Assessment (BA) to consider the impacts of U.S. Border Patrol (USBP), Tucson Sector, activities on Federally listed threatened or endangered species. We are currently in the process of gathering the most current information available regarding Federally listed species potentially occurring within the USBP Tucson Sector. Operational activities of the Tucson Sector are concentrated in Cochise, Pima, Pinal, and Santa Cruz counties of Arizona.

A current list of Federally threatened or endangered species that potentially occur in these counties is included as attachment A. Please review this list for accuracy and completeness. Preliminary discussions with U.S. Fish and Wildlife (USFWS) personnel indicate that the BA should focus on four species within the area: Sonoran Pronghorn (*Antilocapra americana sonoriensis*), Cochise pincushion cactus (*Coryphantha robbinsorum*), American peregrine falcon (*Falco peregrinus anatum*), and Mexican spotted owl (*Strix occidentalis lucida*). However, all Federally listed species potentially occurring in the four-county area will be discussed in the document.

Any information you may have regarding potential or known population locations, critical habitat, general habitat descriptions, distribution, and status of these species would be greatly appreciated. To better assess potential impacts to these species, we would like to present as much data in a GIS format as possible. Any GIS information, or information sources, you could provide regarding current distribution of the above mentioned species would also be appreciated. Additionally, copies of any past Biological Opinions prepared by the USFWS for these species would be very helpful.

We look forward to working with you on this project. If you have any questions, or require additional information, please contact Ms. Linda Ashe of my staff at (817) 978-6382. Thank you for your prompt attention and cooperation.

Sincerely,

William Fickel, Jr.
Chief, Environmental Division

Attachment

Copy Furnished:

Mr. Stephen Smith
Gulf South Research Corporation
7602 GSRI Avenue
Baton Rouge, LA 70820

Mr. Kim Rightmire
Wendy Lopez and Associates
1825 Market Center Blvd., Suite 510
Dallas, TX 75207

ATTACHMENT A

Federally Threatened and Endangered Species in Arizona by County

Cochise County:
American peregrine falcon
Bald eagle
Beautiful shiner
Canello Hills ladies' tresses
Cochise pincushion cactus
Gila topminnow
Huachuca water umbel
Jaguar
Jaguarundi
Lesser long-nosed bat
Mexican gray wolf
Mexican spotted owl
New Mexico ridge-nosed rattlesnake
Northern aplomado falcon
Ocelot
Sonora tiger salamander
Southwestern willow flycatcher
Whooping crane
Yaqui catfish
Yaqui chub

Pima County:
American peregrine falcon
Bald eagle
Cactus ferruginous pygmy owl
Desert pupfish
Gila topminnow
Huachuca water umbel
Jaguar
Jaguarundi
Kearney's blue star
Lesser long-nosed bat
Masked bobwhite
Mexican gray wolf
Mexican spotted owl
Nichols Turk's head cactus
Ocelot
Pima pineapple cactus
San Xavier talussnail
Sonoran pronghorn
Southwestern willow flycatcher

Pinal County:
American peregrine falcon
Arizona hedgehog cactus
Bald eagle
Cactus ferruginous pygmy owl
Desert pupfish
Gila topminnow
Lesser long-nosed bat
Loach minnow
Mexican spotted owl
Nichol's Turk's head cactus
Razorback sucker
Southwestern willow flycatcher
Spikedace
Yuma clapper rail

Santa Cruz County:
American peregrine falcon
Bald eagle
Cactus ferruginous pygmy owl
Canelo Hills ladies' tresses
Desert pupfish
Gila topminnow
Huachuca water umbel
Jaguar
Jaguarundi
Lesser long-nosed bat
Mexican gray wolf
Mexican spotted owl
Northern aplomado falcon
Ocelot
Pima pineapple cactus
Sonoran Chub
Sonora tiger salamander
Southwestern willow flycatcher

APPENDIX B
US FOREST SERVICE SENSITIVE SPECIES

Coronado National Forest Sensitive Species List and Status by Ranger District

Common/Scientific Name	Status on Ranger District				
	Douglas	Nogales	Sierra Vista	Safford	Santa Catalina
PLANTS					
Alamos deer vetch *Lotus alamosanus*		S?			
Aravaipa sage *Salvia amissa*				S	S
Arid throne fleabane *Erigeron arisolius*	S	S	S		
Arizona alum root Heuchera glomerulata	S			S	S
Arizona giant sedge *Carex ultra*	S	S	S	S	S
Arizona manihot *Manihot davisiae*		S			S
Arizona monkshood *Aconitum infectum*		S			S
Bartram stonecrop *Graptopetalum bartramii*	S	S	S		S
Beardless chinch weed *Pectis imberbis*		S	S		
Bigelow thoroughwort *Eupatorium bigelovii*	Su			S	S
Box Canyon muhly *Muhlenbergia dubioides*		S	S		S
Branching penstemon *Penstemon ramosus*	Sd			S near?	
Broad leaf ground cherry *Physalis latiphysa*		S?		S	
Catalina beardtongue *Penstemon discolor*	S	S		S	S
Chihuahuan sedge *Carex chihuahuensis*	S	S	S	S	S
Chihuahuan stickseed *Hackelia ursine*	Su	S		S	S
Chiltepin *Capsicum annuum var. glabriusculum*	Su	S			
Chiricahua dock *Rumex orthoneurus*	S		S	S	
Chiricahua fleabane *Erigeron kuschai*	S				
Chiricahua mock pennyroyal *Hedeoma costatum*			S		
Chiricahua mountain brookweed *Samolus vegans*	S	S	S		S
Chiricahua rock cress *Arabis tricornuta*	S	S	S		S
Chiricahua rock daisy *Perityle cochisensis*	S				

Table 3-5, continued

Common/Scientific Name	Status on Ranger District				
	Douglas	Nogales	Sierra Vista	Safford	Santa Catalina
Chisos coral root *Hexalectris revolute*		S	S?		
Coppermine milk-vetch *Astragalus cobrensis var. maguirei*	S			S	
Counter-clock fishhook cactus *Mammillaria mainiae*					S
Coville bundleflower *Desmanthus covillei*					
Escoba Marina diffusa		S?	S		
Foetid passion flower *Passiflora foetida*		S			
Gentry indigo bush *Dalea tentaculoides*		S			
Goodding's onion *Allium gooddingii*					S
Greene milkweed *Asclepias uncialis*			S		
Hinckley's ladder *Polemonium pauciflorum spp. Hinckleyi*	S				
Huachuca golden aster *Heterotheca rutteri*		S	S		
Huachuca groundsel *Senecio huachucanus*	S	S	S		
Huachuca milk-vetch *Astragalus hypoxylus*			S		
Huachuca milkweed vine *Pherotrichis balbisii*			S		
Huachuca morning glory *Ipomoea plummerae var. cuneifolia*	S	S	S		
Huachuca Mountain coyote thistle *Eryngium phyteumae*			S		
Huachuca Mountain lupine *Lupinus huachuccanus*	S	S	S		
Large-flowered blue star *Amsonia grandiflora*		S	Hd		
Lemmon globe berry *Margaranthus lemmonii*			S		
Lemmon lily *Lilum parryi*	S	S	S		
Lemmon milkweed *Asclepias lemmonii*	S	S	S		
Lemmon's lupine *Lupinus lemmonii*	S			S near?	

Table 3-5, continued

Common/Scientific Name	Status on Ranger District				
	Douglas	Nogales	Sierra Vista	Safford	Santa Catalina
Lemmon's morning glory *Ipomoea tenuiloba var. lemmonii*	S	S	S		S
Lemmon's stevia *Stevia lemmonii*			S		S
Lumholtz nightshade *Solanum lumholtzianum*		S	S		
Mexican broomspurge *Euphorbia gracillima*				S	
Mexican hemlock parsley *Conioselinum mexicanum*		S	S		
Mexican saber daisy *Machaeranthera mexicana*					
Mock pennyroyal *Hedeoma dentatum*	S	S	S	S	S
Needle-spined pineapple					
Nodding blue-eyed grass *Sisyrinchium cernuum*	S	S		S?	S
Pima indian mallow *Abutilon parishii*		S			S
Pinaleno Jacob's ladder *Polemonium flavum*				S	
Pinos altos flame flower *Talinum humile*			S		
Porsild's starwort *Stellaria porsildii*	S				
Pringle's hawkweed *Hieraclum fendleri var. mogollense*					
Redflower onion *Allium rhizomatum*	S		S		
Rusby hawkweed *Hieracium rusbyi*	S		S	S	S
Saiya *Amoreuxia gonzalezii*		S			
Santa Cruz beehive cactus *Coryphantha recuvata*		S	S?		
Santa Cruz star leaf *Choisya mollis*		S			
Santa Cruz striped agave *Agave parviflora spp. Parviflora*		S	S		
Seeman groundsel *Senecio hartwegii*		S	S		
Shade violet *Viola umbraticola*	S		S		S
Smooth ayenia *Ayenia glabra*		S			
Sonoran noseburn *Tragia laciniata*		S	S		

Table 3-5, continued

Common/Scientific Name	Status on Ranger District				
	Douglas	Nogales	Sierra Vista	Safford	Santa Catalina
Sparseleaf hermannia *Hermannia pauciflora*					S
Superb beardtongue *Penstemon superbus*	S	S	S	S	S
Supine bean *Macroptilum supinum*		S	S		
Sweet acacia *Acacia smallii*		S			
Sycamore Canyon muhly *Muhlenbergia xerophila*		S			S
Tepic flame flower *Talinum marginatum*			S		
Texas purple spike *Hexalectris warnockii*			S		
Three-nerved scurf pea *Pediomelum pentaphyllum*					
Thurber hoary pea *Tephrosia thuberi*	S	S	S		
Thurber's morning glory *Ipomoea thurberi*		S	S		
Toumey groundsel *Senecio neomexicanus var. toumeyi*	S				
Trans-Pecos Indian paintbrush *Castilleja nervata*	S				
Trelease agave *Agave schottii var. treleasei*					S
Tucson Mountain spiderling *Boerhavia megaptera*		S			west of?
Tumamoc globeberry *Tumamoca macdougallii*					S
Virlet paspalum *Paspalum virletii*		S	S		
White-flowered cinquefoil *Potentilla albiflora*				S	
Wiggins milkweed vine *Metastelma mexicanum*		S	S		S
Wislizeni gentian *Gentianella wislizeni*	S				
Wooly fleabane *Laennecia eriophylla*		S	S		
Browallia eludens			S		
Coursetia glabella	S		S		
BIRDS					
American peregrine falcon *Falco peregrinus anatum*	S	S	SB	SB	S
Northern Goshawk *Accipiter gentilis*	S	S	SB	SB	S

Table 3-5, continued

Common/Scientific Name	Status on Ranger District				
	Douglas	Nogales	Sierra Vista	Safford	Santa Catalina
Bell's Vireo *Vireo bellii*	S	S	S	SB	
Chihauhuan savannah sparrow *Passerculus sandwichensis rufofuscus*					
Common black-hawk *Buteogallus anthracinus*	S	S?		SB	S
Eared trogon *Euptilotis neoxenus*	S		SB		
Gould's wild turkey Meleagris gallopavo mexicana	S		SB	SB	
Northern gray hawk Asturina nitida maxima	S	S?	SB		
Western yellow-billed cuckoo Coccyzus americanus occidentalis	S	S	S	S?	S
CRUSTACEANS					
Arizona cave amphipod Stygobromus arizonensis	S?		S		
AMPHIBIANS					
Lowland leopard frog Rana yavapaiensis	S?	S	S	SB	S
Ramsey Canyon leopard frog Rana subaquavocalis			S		
Western barking frog *Eleutherodactylus augusti cactorum*	S?	S	S		
MAMMALS					
Arizona shrew *Sorex arizonae*	S	S	S		
Chiricahua fox squirrel Sciurus nayaritensis	S				
Desert bighorn sheep *Ovis canadensis mexicana*				S	SB
Graham Mountains pocket gopher *Thomomys umbrinus grahamensis*				SB	
Southern pocket gopher *Thomomys umbrinus intermedius*			S	SB	
Swift fox *Vulpes velox*					
White-bellied long-tailed vole *Microtus longicaudus leucophaeus*				S	
White-sided jack rabbit *Lepus callotis*	S?			S?	

Table 3-5, continued

Common/Scientific Name	Status on Ranger District				
	Douglas	Nogales	Sierra Vista	Safford	Santa Catalina
REPTILES					
Arizona ridge-nosed rattlesnake *Crotalus willardi willardi*	S	S	S		
Desert massasauga *Sistrurus catenatus edwardsi*	S?		Su		
Giant spotted whiptail *Cnedmidophorus burti stictogrammus*	S?	S	S	S	
Gray-checkered whiptail *Cnemidophorus dixoni*	S?				S
Mexican garter snake *Thamnophis eques megalops*	S?		S	S?	S
Sonoran desert tortoise *Gopheris agassizii*		S	S?	S	SB
FISHES					
Mexican stoneroller *Campostoma ornatum*	S				
Roundtail chub *Gila robusta*					
INSECTS					
A Tiger beetle *Amblycheila baroni*	S	S	S	S	S
A Tiger beetle *Cicindela purpurea cimarrona*				S	
Arizona metalmark *Calephelis arizonensis*	S?	S	S		S
Arizona water penny beetle *Psephenus arizonensis*	S				
Aryxna giant skipper *Agathymus aryxna*	S	S	S	S	S
Chiricahua water scavenger *Cymbiodyta arizonica*	S?				
Chiricahua white *Neophasia terlootii*	S	S	S	S	S
Evansi brigadier *Agathymus evensi*	S	S	S		
False ameletus mayfly *Ameletus falsus*					S
Maricopa tiger beetle *Cicindela oregona maricopa*					
Mexican meadowfly *Sympetrum signiferum*		S	S		
Blue silverspot butterfly *Speyeria nokomis coerulescens*			Su		Su
Obsolete viceroy *Limenitis archippus obsolete*	S?	S	S	S	S
Pima orange tip *Anthocharis pima*	S?	S	S		S

Table 3-5, continued

Common/Scientific Name	Status on Ranger District				
	Douglas	**Nogales**	**Sierra Vista**	**Safford**	**Santa Catalina**
Pinaleno monkey grasshopper *Eumorsea pinaleno*				SB	
Poling's giant skipper *Agathymus polingi*	S	S	S		S
Sabino Canyon damselfly *Argia sabino*		S			SB
Scudder's dusky wing *Erynnis scudderi*	S		S		
Stephan's heterelmis riffle beetle *Heterelmis stephani*		S			
Ursine giant skipper Megathymus ursus	S	S	S		S
White Mountains water penny beetle *Psephenus montanus*					

Source: USFS Coronado National Forest, 2003

Legend:
S – Species documented and likely still present.
Su – Historic presence documented, but no surveys or documented sightings within the past 20 years.
Sd – Species not on District, but action on District may impact species downstream from District.
S? – Species not documented or unknown, but may occur because suitable habitat occurs.
SB – Breeding of species documented
Hd – Critical Habitat not on District, but actions on District may impact Critical Habitat downstream from District.

APPENDIX C
LIST OF STATE PROTECTED SPECIES

State Protected Species of Potential Occurrence in Cochise County, Arizona

Common Name	Scientific Name	Federal Status	WSCA Status	NPL Status
MAMMALS				
Mexican long-tongued bat	*Choeronycteris mexicana*	SC	WC	--
western red bat	*Lasiurus blossevillii*	--	WC	--
lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	E	WC	--
jaguar	*Panthera onca*	E	WC	--
Arizona shrew	*Sorex arizonae*	SC	WC	--
BIRDS				
northern goshawk	*Accipiter gentilis*	SC	WC	--
violet-crowned hummingbird	*Amazilia violiceps*	--	WC	--
Baird's sparrow	*Ammodramus bairdii ammordramus*	SC	WC	--
Sprague's pipit	*Anthus spragueii*	--	WC	--
northern gray hawk	*Asturina nitida maxima*	SC	WC	--
common black-hawk	*Buteogallus anthracinus*	--	WC	--
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	--	WC	--
black-bellied whistling duck	*Dendrocygna autumnalis*	--	WC	--
northern buff-breasted flycatcher	*Empidonax fulvifrons pygmaeus*	SC	WC	--
southwestern willow flycatcher	*Empidonax traillii extimus*	E	WC	--
American peregrine falcon	*Falco peregrinus anatum*	SC	WC	--
Mississippi kite	*Ictinia mississippiensis*	--	WC	--
Mexican spotted owl	*Strix occidentalis lucida*	T	WC	--
elegant trogon	*Trogon elegans tyrannus*	--	WC	--
thick-billed kingbird	*Crassirostris tyrannus*	--	WC	--
tropical kingbird	*Melancholicus agosia*	--	WC	--
REPTILES				
Arizona ridgenose rattlesnake	*Crotalus willardi willardi*	--	WC	--
Sonoran desert tortoise	*Gopherus agassizii*	SC	WC	--
desert massasauga	*Sistrurus catenatus edwardsi*	--	WC	--
Mexican garter snake	*Thamnophis eques megalops*	SC	WC	--
AMPHIBIANS				
Sonoran tiger salamander	*Ambystoma tigrinum stebbinsi*	E	WC	--
western barking frog	*Eleutherodactylus augusti cactorum*	--	WC	--
plains leopard frog	*Rana blairi*	--	WC	--
Chiricahua leopard frog	*Rana chiricahuensis*	PT	WC	--
Ramsey Canyon leopard frog	*Rana subaquavocalis*	SC	WC	--
lowland leopard frog	*Rana yavapaiensis*	SC	WC	--
FISHES				
gila chub	*Gila intermedia*	C	WC	--
Yaqui chub	*Gila purpurea*	E	WC	--
roundtail chub	*Gila robusta*	SC	WC	--
Yaqui catfish	*Poeciliopsis occidentalis sonoriensis*	E	WC	--
loach minnow	*Tiaroga cobitis*	T	WC	--
PLANTS				
plummer onion	*Allium plummerae*	--	--	SR
redflower onion	*Allium rhizomatum*	--	--	SR

Cochise County Continued.

Common Name	Scientific Name	Federal Status	WSCA Status	NPL Status
chiricahua rock flower	*Apacheria chiricahueniss*	--	--	SR
coppermine milk-vetch	*Cobrensis var. maguirei*	SC	--	SR
Huachuca milk-vetch	*Astragalus hypoxylus*	SC	--	SR
playa spider plant	*Cleome multicaulis*	SC	--	SR
Santa Cruz beehive cactus	*Coryphantha recurvata*	--	--	HS
Cochise pincushion cactus	*Coryphantha robbinsorum*	T	--	HS
slender needle corycactus	*Coryphantha scheeri var. valida*	--	--	SR
cob corycactus	*Coryphantha strobiliformis*	--	--	SR
pinaleno hedgehod cactus	*Echinocereus ledingii*	--	--	SR
Texas rainbow cactus	*Echinocereus pectinatus var. pectinatus*	--	--	SR
needle-spined pineapple cactus	*Echinomastus erectocentrus var. erectocentrus*	SC	--	SR
button cactus	*Epithelantha micromeris*	--	--	SR
chiricahua fleabane	*Erigeron kuschei*	SC	--	SR
lemmon fleabane	*Erigeron lemmonii*	C	--	HS
San Carlos wild-buckwheat	*Eriogonum capillare*	SC	--	SR
woodland spurge	*Euphorbia macropus*	SC	--	SR
Wislizeni gentian	*Gentianella wislizeni*	SC	--	SR
Bartram stonecrop	*Graptopetalum bartramii*	SC	--	SR
crested coral root	*Hexalectris spicata*	--	--	SR
Texas purple spike	*Hexalectris warnockii*	SC	--	HS
Huachuca water umbel	*Lilaeopsis schaffneriana var. recurva*	E	--	HS
lemmon lily	*Lilium parryi*	SC	--	SR
leafy lobelia	*Lobelia fenestralis*	--	--	SR
Madrean adders mouth	*Malaxis corymbosa*	--	--	SR
purple adders mouth	*Malaxis porphyrea*	--	--	SR
slender adders mouth	*Malaxis tenuis*	--	--	SR
varied fishhook cactus	*Mammillaria viridiflora*	--	--	SR
Wilcox fishook cactus	*Mammillaria wrightii var. wilcoxii*	--	--	SR
catalina beardtongue	*Penstemon discolor*	--	--	HS
Chiricahua rock daisy	*Cochisensis phyllanthus*	--	--	SR
Thurber's bog orchid	*Platanthera limosa polemonium*	--	--	SR
blumer's dock	*Rumex orthoneurus*	SC	--	HS
fallen ladies'-tresses	*Schiedeella parasitica*	--	--	SR
Huachuca groundsel	*Senecio huachucanus*	--	--	HS
canelo hills ladies'-tresses	*Spiranthes delitescens*	E	--	HS
Michoacan ladies'-tresses	*Stenorrhynchos michuacanus*	--	--	SR
tepic flame flower	*Talinum marginatum*	SC	--	SR
limestone Arizona rosewood	*Vauquelinia californica* spp. *pauciflora*	SC	--	SR
green death camas	*Zigadenus virescens*	--	--	SR

State Protected Species of Potential Occurrence in Pima County, Arizona

Common Name	Scientific Name	Federal Status	WSCA Status	NPL Status
MAMMALS				
Sonoran pronghorn	*Antilocapra americana sonoriensis*	E	WC	--
Mexican long-tongued bat	*Choeronycteris mexicana*	SC	WC	--
western red bat	*Lasiurus blossevillii*	--	WC	--
lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	E	WC	--
California leaf-nosed bat	*Macrotus californicus*	SC	WC	--
jaguar	*Panthera onca*	E	WC	--
BIRDS				
northern goshawk	*Accipiter gentilis*	SC	WC	--
baird's sparrow	*Ammodramus bairdii ammordramus*	SC	WC	--
northern gray hawk	*Asturina nitida maxima*	SC	WC	--
common black-hawk	*Buteogallus anthracinus*	--	WC	--
crested caracara	*Caracara cheriway*	--	WC	--
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	--	WC	--
masked bobwhite	*Colinus virginianus ridgwayi*	E	WC	--
black-bellied whistling duck	*Dendrocygna autumnalis*	--	WC	--
northern buff-breasted flycatcher	*Empidonax fulvifrons pygmaeus*	SC	WC	--
southwestern willow flycatcher	*Empidonax traillii extimus*	E	WC	--
American peregrine falcon	*Falco peregrinus anatum*	SC	WC	--
cactus ferruginous pygmy-owl	*Glaucidium brasilianum cactorum*	E	WC	--
rose-throated becard	*Pachyramphus aglaiae*	--	WC	--
osprey	*Pandoin haliaetus*	--	WC	--
Mexican spotted owl	*Strix occidentalis lucida*	T	WC	--
thick-billed kingbird	*Crassirostris tyrannus*	--	WC	--
tropical kingbird	*Melancholicus agosia*	--	WC	--
REPTILES				
Sonoran desert tortoise	*Gopherus agassizii*	SC	WC	--
Mexican garter snake	*Thamnophis eques megalops*	SC	WC	--
cowles fringe-toed lizard	*Uma notata rufopunctata*	SC	WC	--
AMPHIBIANS				
great plains narrowmouth toad	*Gastrophyryne olivacea*	--	WC	--
lowland burrowing treefrog	*Pternohyla fodiens*	--	WC	--
Chiricahua leopard frog	*Rana chiricahuensis*	PT	WC	--
lowland leopard frog	*Rana yavapaiensis*	SC	WC	--
FISHES				
Quitobaquito desert pupfish	*Cyprinodon macularius eremus*	E	WC	--
desert pupfish	*Cyprinodon macularius macularius*	E	WC	--
gila chub	*Gila intermedia*	C	WC	--
gila topminnow	*Poeciliopsis occidentalis occidentalis*	F	WC	--
PLANTS				
Pima indian mallow	*Abutilon parishii*	SC	--	SR
thurber indian mallow	*Abutilon thurberi*	--	--	SR
Santa Cruz striped agave	*Agave parviflora ssp. parviflora*	SC	--	HS
trelease agave	*Agave schottii var. treleasei*	SC	--	HS
goodding onion	*Allium gooddingii*	SC	--	HS
plummer onion	*Allium plummerae*	--	--	SR

Pima County Continued.

Common Name	Scientific Name	Federal Status	WSCA Status	NPL Status
saiya	*Amoreuxia gonzalezii*	SC	--	HS
Kearney's blue star	*Amsonia kearneyana*	E	--	HS
Pima pineapple cactus	*Coryphantha scheeri var. robustispina*	E	--	HS
gentry indigo bush	*Dalea tentaculoides*	--	--	HS
Nichol turk's head cactus	*Echinocactus horizonthalonius var. nicholii*	E	--	HS
acuna cactus	*Echinomastus erectocentrus var. acunensis*	C	--	HS
needle-spined pineapple cactus	*Echinomastus erectocentrus var. erectocentrus*	SC	--	SR
San Carlos wild-buckwheat	*Eriogonum capillare*	SC	--	SR
golden barrel cactus	*Ferocactus eastwoodiae*	--	--	SR
Bartram stonecrop	*Graptopetalum bartramii*	SC	--	SR
crested coral root	*Hexalectris spicata*	--	--	SR
Huachuca water umbel	*Lilaeopsis schaffneriana var. recurva*	E	--	HS
lemmon lily	*Lilium parryi*	SC	--	SR
broadleaf twayblade	*Listera convallarioides*	--	--	SR
senita	*Lophocereus schottii*	--	--	SR
feather bush	*Microphylla var. thornberi*	--	--	SR
slender adders mouth	*Malaxis tenuis*	--	--	SR
fishhook cactus	*Mammillaria mainiae*	--	--	SR
thornber fishhook cactus	*Mammillaria thornberi*	--	--	SR
varied fishhook cactus	*Mammillaria viridiflora*	--	--	SR
dahlia rooted cereus	*Neoevansia striata*	--	--	SR
catalina beardtongue	*Penstemon discolor*	--	--	HS
Ajo rock daisy	*Perityle ajoensis*	--	--	SR
Thurber's bog orchid	*Platanthera limosa polemonium*	--	--	SR
fallen ladies'-tresses	*Schiedeella parasitica*	--	--	SR
organ pipe cactus	*Stenocereus thurberi*	--	--	SR
blue sand lily	*Palmeri tumamoca*	--	--	SR
tumamoc globeberry	*Macdougalii vauquelinia*	--	--	SR

State Protected Species of Potential Occurrence in Santa Cruz County, Arizona

Common Name	Scientific Name	Federal Status	WSCA Status	NPL Status
MAMMALS				
Mexican long-tongued bat	*Choeronycteris mexicana*	SC	WC	--
western red bat	*Lasiurus blossevillii*	--	WC	--
lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	E	WC	--
California leaf-nosed bat	*Macrotus californicus*	SC	WC	--
Arizona shrew	*Sorex arizonae*	SC	WC	--
BIRDS				
northern goshawk	*Accipiter gentilis*	SC	WC	--
violet-crowned hummingbird	*Amazilia violiceps*	--	WC	--
baird's sparrow	*Ammodramus bairdii ammordramus*	SC	WC	--
Sprague's pipit	*Anthus spragueii*	--	WC	--
northern gray hawk	*Asturina nitida maxima*	SC	WC	--
common black-hawk	*Buteogallus anthracinus*	--	WC	--
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	--	WC	--
black-bellied whistling duck	*Dendrocygna autumnalis*	--	WC	--
southwestern willow flycatcher	*Empidonax traillii extimus*	E	WC	--
American peregrine falcon	*Falco peregrinus anatum*	SC	WC	--
cactus ferruginous pygmy-owl	*Glaucidium brasilianum cactorum*	E	WC	--
rose-throated becard	*Pachyramphus aglaiae*	--	WC	--
osprey	*Pandion haliaetus*	--	WC	--
black-capped gnatcatcher	*Polioptila nigriceps*	--	WC	--
Mexican spotted owl	*Strix occidentalis lucida*	T	WC	--
elegant trogon	*Trogon elegans tyrannus*	--	WC	--
thick-billed kingbird	*Crassirostris tyrannus*	--	WC	--
tropical kingbird	*Melancholicus agosia*	--	WC	--
REPTILES				
Arizona ridgenose rattlesnake	*Crotalus willardi willardi*	--	WC	--
Mexican vine snake	*Oxybelis aeneus*	--	WC	--
Mexican garter snake	*Thamnophis eques megalops*	SC	WC	--
AMPHIBIANS				
Sonoran tiger salamander	*Ambystoma tigrinum stebbinsi*	E	WC	--
western barking frog	*Eleutherodactylus augusti cactorum*	--	WC	--
great plains narrowmouth toad	*Gastrophryne olivacea*	--	WC	--
Chiricahua leopard frog	*Rana chiricahuensis*	PT	WC	--
lowland leopard frog	*Rana yavapaiensis*	SC	WC	--
FISHES				
Sonoran chub	*Gila ditaenia*	T	WC	--
gila chub	*Gila intermedia*	C	WC	--
roundtail chub	*Gila robusta*	SC	WC	--
gila topminnow	*Poeciliopsis occidentalis occidentalis*	E	WC	--
PLANTS				
Pima indian mallow	*Abutilon parishii*	SC	--	SR
Santa Cruz striped agave	*Agave parviflora ssp. parviflora*	SC	--	HS
redflower onion	*Allium rhizomatum*	--	--	SR
saiya	*Amoreuxia gonzalezii*	SC	--	HS
Huachuca milk-vetch	*Astragalus hypozylus*	SC	--	SR

Santa Cruz County Continued.

Common Name	Scientific Name	Federal Status	WSCA Status	NPL Status
Santa Cruz beehive cactus	*Coryphantha recurvata*	--	--	HS
Pima pineapple cactus	*Coryphantha scheeri var. robustispina*	E	--	HS
gentry indigo bush	*Dalea tentaculoides*	SC	--	HS
woodland spurge	*Euphorbia macropus*	SC	--	SR
Bartram stonecrop	*Graptopetalum bartramii*	SC	--	SR
crested coral root	*Hexalectris spicata*	--	--	SR
Huachuca water umbel	*Lilaeopsis schaffneriana var. recurva*	E	--	HS
lemmon lily	*Lilium parryi*	SC	--	SR
leafy lobelia	*Lobelia fenestralis*	--	--	SR
Mexican lobelia	*Lobelia laxiflora*	--	--	SR
supine bean	*Macroptilium supinum*	SC	--	SR
Madrean adders mouth	*Malaxis corymbosa*	--	--	SR
purple adders mouth	*Malaxis porphyrea*	--	--	SR
Wilcox fishook cactus	*Mammillaria wrightii var. wilcoxii*	--	--	SR
catalina beardtongue	*Penstemon discolor*	--	--	HS
whisk fern	*Psilotum nudum*	--	--	HS
fallen ladies'-tresses	*Schiedeella parasitica*	--	--	SR
Huachuca groundsel	*Senecio huachucanus*	--	--	HS
canelo hills ladies'-tresses	*Spiranthes delitescens*	E	--	HS
Pinos Altos flame flower	*Talinum humile*	SC	--	SR
tepic flame flower	*Talinum marginatum*	SC	--	SR

State Protected Species of Potential Occurrence in Yuma County, Arizona

Common Name	Scientific Name	Federal Status	WSCA Status	NPL Status
MAMMALS				
Sonoran pronghorn	*Antilocapra americana sonoriensis*	E	WC	--
spotted bat	*Euderma maculatum*	SC	WC	--
California leaf-nosed bat	*Macrotus californicus*	SC	WC	--
BIRDS				
great egret	*Ardea alba*	--	WC	--
western yellow-billed cuckoo	*Coccyzus americanus occidentalis*	--	WC	--
snowy egret	*Egretta thula*	--	WC	--
southwestern willow flycatcher	*Empidonax traillii extimus*	E	WC	--
cactus ferruginous pygmy-owl	*Glaucidium brasilianum cactorum*	E	WC	--
California black rail	*Laterallus jamaicensis coturniculus*	SC	WC	--
Yuma clapper rail	*Rallus longirostris yumanensis*	E	WC	--
REPTILES				
Sonoran desert tortoise	*Gopherus agassizii*	SC	WC	--
flat-tailed horned lizard	*Phrynosoma mcallii*	SC	WC	--
cowles fringe-toed lizard	*Uma notata rufopunctata*	SC	WC	--
FISHES				
razorback sucker	*Xyrauchen texanus*	E	WC	--
PLANTS				
parish onion	*Allium parishii*	--	--	SR
senita	*Lophocereus schottii*	--	--	SR
straw-top cholla	*Opuntia echinocarpa*	--	--	SR
sand food	*Pholisma sonorae*	SC	--	SR
Kearney sumac	*Rhus kearneyi*	--	--	SR
blue sand lily	*Palmeri washingtonia*	--	--	SR
California fan palm	*Filifera charina trivirgata*	--	--	SR

Legend: WSCA – Wildlife of Special Concern in Arizona
NPL – Arizona Native Plant Law
E – Federally Endangered
T – Federally Threatened
C – Candidate
PT – Proposed Threatened
SC – Species of Concern
WC – Wildlife of Special Concern
SR – Salvage Restricted: collection only with permit
HS– Harvest Restricted: permits required to remove plant by-products

Source: Arizona Game and Fish Department 2000b. Last Updated October 25, 2000.

APPENDIX D
CULTURAL RESOURCES

APPENDIX D: Cultural Resources

The cultural chronology of Arizona is commonly divided into five periods: Paleo-Indian, Archaic, Formative, Protohistoric, and Historic. These periods are commonly subdivided on particular characteristics of the artifact assemblages. The prehistoric periods and corresponding phases are defined by the presence of particular diagnostic artifacts such as projectile points, certain types of pottery, and occasionally, particular site locations. For the Historic Period, documentary information more often is used to distinguish certain phases; nevertheless, particular artifacts also can be used to recognize certain historic affiliations.

Paleo-Indian (10,000-7,500 B.C.)

The nature and temporal position of the first people in southern Arizona is a subject of debate. Most researchers contend that successive migrations occurred throughout the later part of the Pleistocene, coinciding with global temperature drops that resulted in massive quantities of water being frozen. As the ice caps increased in size, sea levels dropped, exposing land bridges in the areas where the sea was the shallowest. One of these land bridges connected Alaska with Siberia across the Bering Strait. This land bridge has successively appeared and disappeared over the last 100,000 years as temperatures fluctuated.

A majority of the best-known Paleo-Indian sites in the southwest are in southern Arizona. The earliest occupations at these sites are named after a site near Clovis, New Mexico and are recognized by a particular fluted projectile point type that is thought to have been used for hunting big game such as mammoth, mastodon, and camel. To a certain extent, this view is probably biased because most Clovis sites that have been excavated are kill sites. Plant gathering and processing was, no doubt, an important aspect in the lives of early Paleo-Indians. Of particular importance are the sites in the San Pedro and Sulphur Springs valleys in southeastern Arizona, such as Naco, Murray Springs, Leikham, and Navarette, which have extinct mammal bones, associated with Paleolithic artifacts.

For the Papagueria, or south-central Arizona, the earliest dated site is Ventana Cave. Among the bones of extinct dire wolf, jaguar, shasta ground sloth, and horse, an

assemblage of almost 100 tools was recovered. A single point with a concave base represents the Clovis affiliation, while an assemblage of steeply retouched flakes, along with blocky, unifacially and bifacially reduced cobbles, reveals an association with a far western desert Paleo-Indian tradition often referred to as the San Dieguito, known principally in California. Haury (1950) termed this early material the Ventana complex and believed that it was affiliated with the San Dieguito tradition. Radiocarbon dates for the Ventana complex range from 11,300 to 12,600 B.C. (Haury and Hayden 1975). Malcolm Rogers (1945a) originally identified the earliest archeological manifestation in the southwest as the Malpais Industry, but later concluded that the differences he saw between artifacts from the Malpais Industry and San Dieguito complex were more apparent than real (Rogers 1958).

San Dieguito Complex (10,000-5,000 B.C.)

The earliest accepted prehistoric complex for the Colorado River sub region is the San Dieguito Complex, which was defined first along the southern coastal area near San Diego at the C.W. Harris Site (Rogers 1938; Warren 1966). The San Dieguito complex in California overlaps and runs into the Archaic Period in the Arizona chronology. Groups associated with the San Dieguito Complex probably were organized as small bands and were nomadic hunter-gatherers. On a general level, the material culture of the San Dieguito Complex reflects an adaptation focusing on the hunting of animals, not dissimilar in pattern to late Paleo-Indian cultures (Eighmey 1990; Robbins-Wade 1986). Diagnostic lithic artifacts associated with the San Dieguito Complex include well-made foliate knives and projectile points, heavy "horse-hoof" planes, and crescent-shaped stones (Moratto 1984; Eighmey 1990; Robbins-Wade 1990). San Dieguito points and knives are narrow and long in profile with thick cross-sections and the points are usually basal notched (Warren 1966; Davis 1969). Overall, this complex is very similar to contemporary cultures in the Great Basin associated with the Western Pluvial Lakes Tradition (Bedwell 1970; Chartkoff and Chartkoff 1984).

Archaic (7,500-400 B.C.)

The cultural remains of Archaic people, post-Pleistocene foragers, are more common manifestations than those of Paleo-Indian populations. The cultural affiliation and age of Archaic materials in southern Arizona are not well understood. Two Archaic traditions have been proposed for southern Arizona: the Desert culture (also called San Dieguito II

and III) and the Cochise culture. Haury (1950) and Ezell (1954) have argued that the Papagueria was the zone of contact between the Cochise culture, located primarily within southeastern and south-central Arizona and New Mexico, and the Desert culture, recorded in southern California (Rogers 1939; Hester 1973; King 1976) and southwestern Arizona (Rogers 1941; Haury 1950; Hayden 1970; Rosenthal et al. 1978). Other researchers disagree with Haury and Ezell, arguing instead that the Desert culture is a pan-southwestern occurrence extending from California to the Trans-Pecos Region of Texas.

People associated with another complex called the Amargosan are believed to have migrated into east-central Arizona, displacing cultures affiliated with the San Dieguito complex at about 3000 B.C. (Rogers 1958). The eastern aspect of the Amargosan complex produced two-phase patterns, Amargosa I and II, both of which were found at Ventana Cave (Haury 1950). At either the beginning of or during Amargosa II times, trough and basin metates and mortars appeared in southern Arizona for the first time (Rogers 1958).

The three Cochise culture stages generally recognized include the Sulphur Springs, Chiricahua, and San Pedro (Sayles and Antevs 1941). The Sulphur Springs stage (ca. 7500 B.C. to 3500 B.C.), considered to be a specialized, Paleo-Indian adaptation, is known only from a few sites near Double Adobe in southeastern Arizona (Whalen 1971). The Chiricahua stage, dated by Whalen (1975) from 3500 B.C. to 1500 B.C., marks another aspect of the Archaic Period in southern Arizona. Several researchers believe that maize and squash were introduced during the Chiricahua stage (Dick 1951; Martin and Schoenwetter 1960). The San Pedro stage tentatively dates from 1500 B.C. to 100 A.D. (Whalen 1975). Listed among the material cultural inventory are deep basin metates, shaped pestles, mortars, two-hand manos, and an increase in the type and number of pressure flaked tools (Sayles et al. 1958). Pithouses and storage features, agriculture (beans, maize, and squash), and pottery appear at the end of the San Pedro stage (Sayles 1945; Martin et al. 1949; Eddy 1958; Dick 1965).

Due to the nature of the local vegetal material, radiocarbon dates are available only for the later part of the Archaic Period, namely, to the time immediately preceding the rise of sedentism and agriculture in southern Arizona. These dates suggest that the Archaic persisted into the first millennium A.D.

Amargosa/Elko Period (1,500 B.C. - A.D. 900)

Sites representing the Amargosa/Elko Period are not well represented in the Colorado River sub region (Eighmey 1990) and are more frequent in the Mojave Desert and Peninsular Ranges (Moratto 1984; Eighmey 1990). Nevertheless, the Amargosa/Elko Period appears to bridge the interval of time when cultures were shifting from use of the spear and atlatl to the bow and arrow pestles which implies a heavier reliance on plant foods (especially hard seeds) in some areas (Moratto 1984). During the Amargosa/Elko Period technological changes are also represented by an increase in the number of manos and metates and the introduction of mortars and pestles (Moratto 1984). Shaft smoothers, incised stone tablets and pendants, hollowed-out stone tubes, shell beads, and bone awls also are associated with this period. An additional impetus behind the introduction of new technologies in the southern desert region may have been increasing contacts with desert populations to the east of the Colorado River, as well as the California coastal zone (Moratto 1984).

Formative (A.D. 100-1,450)

Following the Archaic, the Formative Period refers to the prehistoric ceramic-making agriculturalists. In southern Arizona, some researchers date the beginning of the Formative as early as 300 B.C. (Haury 1976), and others as late as A.D. 500 (Schiffer 1982). In south-central Arizona, the principal inhabitants are called Hohokam, a Piman word meaning "all used up" (Haury 1976). Peripheral cultures are the Trincheras in northern Sonora (Bowen n.d.; Sauer and Brand 1931; Hinton 1955; Johnson 1960, 1963; McGuire and Villalpando 1991), the Mogollon in eastern Arizona (Douglas and Brown 1984, 1985), and the Patayan in western Arizona (Rogers 1945a; Waters 1982).

Hohokam Culture

When and where the Hohokam arose is still unresolved. Di Peso (1956) and Hayden (1970) believed that the prehistoric people antecedent to the Hohokam in southern Arizona followed the Ootam tradition. Di Peso contended that the Ootam were an indigenous group who came under the rule of Mexican intruders, the Hohokam, from roughly A.D. 900 to 1200. Other researchers have viewed the Hohokam culture as an evolution of indigenous Archaic populations who were influenced by ideas coming from Mexico (Wasley and Johnson 1965; Wilcox 1979).

The Hohokam cultural has been defined primarily from sites along the Salt, Gila, and Santa Cruz rivers. In addition to this core area there is also the "Desert Branch" of the Hohokam, which was used to explain variability between contemporaneous populations; those living in the core area of the Salt-Gila and Tucson Basins, the Riverine Hohokam, and those living in the Papagueria, the Desert Hohokam. After A.D. 1000, differences can be clearly seen in burial practices, pottery types, metate types, projectile points, carved stone, figurines, pallettes, stone jewelry, shell jewelry, and subsistence patterns.

Hohokam culture history is generally divided into four temporal periods: the Pioneer Period (A.D. 425-750), Colonial Period (A.D. 750-950), Sedentary Period (A.D. 950-1150) and the Classic Period (A.D. 1150-1450). The Pioneer Period is ill defined and based largely on excavations at Snaketown. Hohokam population increased greatly during the Colonial Period as improved irrigation in the Phoenix Basin and to a lesser extent in the Tucson Basin, allowed for the reliable cultivation of maize, beans, squash, and cotton. Primary Village sites with ball courts were constructed along major drainages and cremation burial practices replaced inhumation burial practices. During the Sedentary Period settlement expanded into the secondary drainages and bajadas and agricultural strategies expanded to include rock piles and rock pile fields. Dry farming techniques were employed increasingly in the Santa Cruz Valley. By the Classic Period dramatic changes occurred in the architectural styles, burial practices and material culture. Adobe-walled pit houses and later, above ground adobe and stone masonry structures surrounded by adobe or stone walls replaced the previous pit house style of architecture. Ball court construction had ceased and was replaced by construction of earthen platform mounds, possibly Mesoamerican derived in the large villages. Larger villages were settled situated on major drainages. The abrupt changes during the Colonial Period may have been the result of increased warfare in the area (Lascaux 1998).

Trincheras Culture

The region occupied by the Trincheras culture has been demarcated by Bowen (n.d.) as extending from Puerto Libertad on the south to the international border on the north, and from the Gulf of California on the west to the Rio San Miguel on the east. The pottery series within this area is fairly well documented. Sauer and Brand (1931) have described Trincheras Purple-on-red and Nogales Polychrome. Bowen (n.d.) refined the painted pottery types to include Purple-on-brown and Purple-on-red. Trincheras Polychrome was

defined by Di Peso (1956). Even though the types within the Trincheras series have not been securely dated, it is believed that they were produced over a considerable period of time. Cross-dating indicates that most of the Trincheras types were in use at least as early as the Hohokam Colonial Period (A.D. 800) and may have extended until Spanish contact though terminal dates are problematic (McGuire and Villapando 1991, Bowen n.d., Braniff 1978).

The most distinctive aspect of the Trincheras Culture is the “cerros de trincheras”. These are features consisting of dry-laid rock walls, terraces, structures, enclosures, and trails on hill slopes and hilltops. These sites are thought to have multiple functions including garden plots, habitation, and defense due to their location. Based on surveys in Sonora, these may have been constructed as early as A.D. 800. However most date to after A.D. 1100 although southern Arizona sites date A.D. 1100-1300 and have no associative pottery (Lascaux 1998).

Evidently, the Trincheras people exploited a variety of environmental zones including hilltop terraces, inland ridges, floodplains, and valleys (Bowen n.d.; McGuire and Villalpando 1991). A variety of subsistence strategies were utilized including floodwater, runoff and limited canal irrigation agriculture, along with exploitation of wild resources.

Several Trincheras sites display evidence of shell jewelry production and the preparation of shell bracelet "blanks". The Trincheras people moved large quantities of shell material to the Playa site between A.D.800 and A.D. 1200 (Johnson 1960). In the Papagueria it has been hypothesized that shell was used by the populations as barter for agricultural products from the Salt-Gila Basin Hohokam, thus assuring themselves access to resources necessary to serve as a "buffering mechanism," shielding them from the vagaries of agriculture in a desert environment (Doelle 1980). It is conceivable that the Trincheras people utilized a similar strategy or participated in the Papaguerian system.

Patayan Culture

Much of the confusion regarding the Ceramic Period has been resolved by Waters (1982) who basically adopted Rogers' (1940, 1945a, 1945b) diagnostic ceramic traits to provide chronological and typological distinctions for Lowland Patayan pottery types. Three ceramic periods have been defined: Patayan I (A.D. 700-1000), Patayan II (A.D.

1000-1500), Patayan III (A.D. 1500-Present). It must be mentioned that Waters' time periods and ceramic typology have not met universal acceptance (Schroeder 1952, 1967). Unfortunately, the only stratified site excavated to date has been poorly reported (Harner 1958). However, Harner's results appear to contain important differences from those of Rogers, Waters, and Schroeder. Huckell's (1979) excavations in the Crater Mountains have produced data that may be in conflict as well with the time scheme outlined above. Schaefer et al. (1987) proposed a similar chronology based on three periods Patayan I (ca. AD 900-1050), Patayan II (ca. A.D. 1050-1450), and Patayan III (ca. A.D. 1450-1800) based on the works of Shroeder (1952,1957,1961) and Harner (1958).

The frontier between Hohokam and Patayan ceramic types is a short distance west of a line between Gila Bend, Arizona, and OPCNM (Ezell 1954). The excavations conducted by Wasley and Johnson (1965) between Agua Caliente and Gila Bend revealed sites with Patayan pottery and a few intrusive Hohokam sherds. Sites farther west on the Gila River exhibit Patayan ceramics almost exclusively (Schroeder 1952; Breternitz 1957; Vivian 1965). South, near the international border, sites with Patayan sherds were recorded east of the Ajo Mountains in the Quijotoa Valley by Rosenthal et al. (1978). Patayan sherds also were found at sites west of the Ajo Mountains in OPCNM. Immediately west of Organ Pipe, in the CPNWR, the sites described by Fontana (1965) were dominated by Patayan wares, as were sites in the Sierra Pinacates (Hayden 1967).

The ceramic-bearing Patayans who settled along the lower Colorado and Gila rivers adopted a subsistence strategy of floodwater farming, gathering, and hunting of small game (Rogers 1945a; Schroeder 1957). Riverine settlements were composed of individual households in a dispersed, or rancheria pattern. Initially, habitations were round or oval, domed, jacal structures with rock foundations that lacked roof supports. Later, houses along the river were also jacal, but square in plan with four roof supports. Structures away from the rivers were domed jacals during all time periods.

The earliest users of Patayan pottery are unclear. Malcolm Rogers (1945a) was of the opinion that the makers of Patayan I (Yuman I) ceramics were immigrants from southern California who, along with the Hohokam, learned to make pottery from people in Mexico. Rogers perceived a hiatus in the local development about A.D. 1000 and concluded that

the Patayan I people were not biologically ancestral to the modern Yumans. Harner (1958), on the other hand, saw a direct continuum in Patayan I and II materials. According to Rogers, the makers of Patayan II pottery were the descendants of new immigrants and/or people who settled in the area as a result of internecine warfare on the Colorado River. These people eventually became the modern day Yumans (Rogers 1945a). Rogers (1945a) viewed Patayan II times as ones of expansion and suggested that the trincheras sites in Sonora and the Gila Bend Fortified Hill site (Greenleaf 1975) were responses to raiding by Patayan groups. During the Patayan II Period, groups of presumed Yuman-speakers filtered into the Colorado Desert and settled along the shore of Lake Cahuilla (Rogers 1945; Moratto 1984). Groups associated with the Patayan II Period constructed domed-shaped, brush-walled houses and cremated their dead. Coprolite studies have revealed a rich diet among the Patayan II inhabitants of Lake Cahuilla, including fish, shellfish, aquatic birds, mammals, and a number of freshwater marsh and lowland desert plants (Wilke 1978). It appears that cultigens were not part of the Lake Cahuilla diet (Weide 1976). During this time there was active trade in seashells between groups living in the desert and others living along the Gulf of California and the southern Pacific coast. At the end of the Patayan II Period, it is believed that the Colorado River ceased to drain into Lake Cahuilla and that the lake rapidly began to shrink in size, becoming saline as a result. Thus, it appears that populations in the Colorado Desert quickly dispersed into adjacent areas such as the Lower Colorado River Valley and Peninsular Ranges (O'Connell 1971; Wilke 1978). By Patayan III times, very few inhabitants remained in the Colorado Desert, and of those, the majority were occupying the vestiges of Lake Cahuilla near the present-day shoreline of the Salton Sea (Rogers 1945; Schaefer et al. 1987). Along the Lower Colorado River there had been a continuous occupation of the area from Patayan I through Patayan III times.

Huge figures, or intaglios created on the ground surface are an unusual characteristic of the Lowland Patayan culture. Patterns were formed by cutting, trenching, scraping, outlining with stones, heaping material, or combinations of the above (Hayden 1982; Solari and Johnson 1982). The figures are striking because the desert pavement on which they were constructed provides a dark, contrasting background. Often depicted are anthropomorphic and zoomorphic figures, abstracts, and "avenidas" stretching for as much as 700 ft. (Hayden 1982; Solari and Johnson 1982). Hayden (1982) reported ground figures associated with the Malpais Industry, Phase I of the San Dieguito complex,

and the Amargosan complex. Solari and Johnson (1982) concurred with Hayden in a general sense, stating that Yumans, specifically Mohave, and their prehistoric Patayan forbearers constructed the ground figures. Rogers (1945a) contended that the figures are from Patayan I, II, and III times. The function of these figures remains obscure.

The Mogollon and Pueblo Cultures

The Mogollon culture evolved from the Cochise culture; in fact, early Mogollon villages appear to be little more than late Archaic villages with pottery (Sayles 1945). The hallmarks of this stage are agriculture, red-on-brown pottery, and pit houses. Southeastern Arizona has been included in the San Simon Branch of the Mogollon (Sayles 1945), which has been divided into three periods and six phases. The Early Period consists only of the Penasco phase, which was derived from the San Pedro stage of the Cochise culture. In essence, the only difference appears to be the addition of plain ware and red slipped pottery. Following this is an intermediate period composed of the Dos Cabezas, Pinaleno, and Galiuro phases, which are defined by the introduction of decorated ceramics. The Late Period is composed of the Cerros and Encinas phases, which exhibit considerable influence from the Hohokam to the northwest and Mimbres to the east (Sayles 1945). Although dates for these phases are not clear, the whole sequence likely ranges from about A.D. 200 to 1200.

The appearance of rock and adobe pueblos in the southeastern part of Arizona has been identified with three traditions. One of these traditions is the Ringo phase that, unfortunately, is known only from a single excavation in the Sulphur Springs Valley. The Ringo site consists of two small adobe compounds with 27 rooms with a variety of ceramic trade wares. The ceramic assemblage suggests contact with four areas; (1) Chihuahua (over 25% of the decorated wares), (2) the White Mountain area, (3) the Tonto Basin (these ceramics could have been made locally), and (4) the Tucson Basin (Johnson and Thompson 1963). The suggested dates for them fall between 1250 and 1325 (Johnson and Thompson 1963). The Ringo phase, although interpreted as basically Mogollon, reflects outside influences likely from the Anasazi to the north or possibly the Chihuahuan area to the south (Johnson and Thompson 1963).

The Animas phase, best known from Hidalgo County, New Mexico, is represented at the Pendleton Ruin (Kidder et al. 1949). This phase generally has been interpreted very

differently from the Ringo phase even though the two overlap temporally. The dating of the Animas phase (ca. A.D. 1175-1350) and the presence of Ramos Polychrome and other Casas Grandes pottery types implies an association with Casas Grandes at its zenith. Unlike the Ringo site, a number of Animas sites fall in the 100 to 300-room category. The nature of the association between the Animas phase and Casas Grandes has been debated for the last 30 years. Kidder et al. (1949) argued that the traits found at the Pendleton Ruin were quite distinct from those at Casas Grandes. More recent researchers have accepted the Animas phase as peripheral to Casas Grandes, but directly interacting with the core area (LeBlanc 1980; DeAtley and Findlow 1980). These authors viewed the Animas phase as non-Mogollon. In fact, LeBlanc (1980) specifically suggests a population movement from the south into the Mimbres Valley that absorbed the remaining indigenous population. Others remain unconvinced of a Casas Grandes expansion into southwestern New Mexico, pointing out that the five excavated Animas phase sites, the few available dates, and the published survey data collected by DeAtley and Findlow (1980) do not present enough data for such a conclusion.

The term Animas phase has not been generally applied in southeastern Arizona. Nevertheless, the great similarities in ceramic types and their frequencies, architectural features, burial patterns, and projectile point styles between most of the pueblo sites in southeastern Arizona and the Animas phase sites in southwestern New Mexico suggest that they are part of the same cultural tradition (Amsden 1928; Sauer and Brand 1930; Kidder et al. 1949; Neily and Beckwith 1985; LeBlanc 1980; DeAtley and Findlow 1980; Klein et al. 1982).

Protohistoric Period

The abandonment of the large aggregated pueblos in the Southwest around A.D. 1450 marks the beginning of the Protohistoric Period in Arizona, which is another time period that is poorly understood. Based on cross-dating with Hohokam and Salado ceramics, Di Peso (1951) concluded that the inhabitants of Babocomari Village in the San Pedro Valley moved into that vicinity at a time roughly contemporaneous with the Tucson phase, ca. A.D. 1200-1450. It is possible that abandonment occurred quite late, perhaps during Apache times (Di Peso 1951). If this is the case, then Babocomari Village represents the only large Protohistoric site excavated to date.

The Protohistoric Period in the Colorado River subregion began with the exploration of the mouth of the Colorado River by Alarcon in 1540. Some 60 years later, the Spanish explorer Oñate led an expedition down the Lower Colorado River. At the time, the Colorado River subregion was inhabited by Yuman- speakers of the Hokan stock (Moratto 1984). Tribes affiliated with the Yuman language group inhabited the Lower Colorado River, while speakers of the Southern Diegueño language occupied the Colorado Desert. As mentioned above, tribes along the Lower Colorado River were agricultural and grew maize, beans, squash, and some melons (Eighmey 1990). In the Colorado Desert, tribal groups were more reliant on hunting and gathering. However, some horticulture may have been practiced in the area from time to time; a practice probably adopted from the tribes living along the Lower Colorado River (Schaefer et al. 1987). Groups from the Colorado Desert also went into the Peninsular Ranges to hunt deer and gather mescal (Schaefer et al 1987).

Historic Period

The Historic Period can be broken up into a Spanish/Mexican Period (A.D. 1699-1856) and an American Period (A.D. 1856-1945). Spanish exploration of the area began in 1539 with the explorations of Francisco Vasquiez de Coronado, Melachor Diaz, and Alarcon in 1540. In 1687 the Jesuit missionary Eusebio Francisco Kino traveled through the Santa Cruz Valley and the adjacent Papagueria. During his travels he established a chain of missions, which allowed for an influx of Spanish missionaries, explorers, miners, ranchers, and settlers. Silver strikes in 1736 to 1741 and the discovery of gold in Arizona and California during the mid to late 1800s caused a great influx of settlers and prospectors into the area. Tensions increased between the Native American populations and the European settlers and resulted in revolts by the Pima and Papago, and raids by the Apache. By the mid 1800s the El Camino del Diablo became a popular route connecting Sonoita, Mexico to Yuma, Arizona, for people traveling to California. The loss of life from unprepared parties and the Pinacatenos attacks along the route were high (Sykes 1937).

The Gadsden Purchase occurred in 1854 but was not until 1856 that the land left Mexican domain and came under the control of the United States. This ushered in the American Period (1856-1945). Travelers were still coming into the area lured by gold and silver found in Arizona and California. Apache attacks on travelers and settlers of the area prompted the establishment of several forts in southern Arizona and the stationing of

troops in the San Bernardino Valley at Silver Creek, Guadalupe Canyon, and, briefly in 1878, at Camp Supply (Wells 1927).

The Apaches continued to raid the San Pedro Valley until 1884 when Colonel George Crook forced them onto the San Carlos Reservation. In 1885, a large number of Apaches led by Geronimo fled the reservation, crisscrossing southeastern Arizona and southwestern New Mexico. However, in 1886 they surrendered to General Crook at Cañon de los Embudos in the mountains 30 miles south of the San Bernardino Ranch Headquarters.

At the turn of the century the area became a profitable cattle ranching area. The Anglo-American ranchers in the area employed the local Papago population enabling the Papago to learn a considerable amount about the cattle ranching industry and allowing them to make a shift from subsistence pastoralism to cash ranching. Tensions developed between Papago ranchers and Anglo-American Ranchers over grazing land and waterholes but never resulted in violent conflicts due to the collapse of the cattle market and the establishment of the Papago Reservation (Spicer 1962). The Papago were the last Native American tribe to acquire a reservation. Also during this time ore smelting became a profitable industry and smelters were built in both Douglas and Bisbee. This prompted the development of railroads in the area to transport the ore (Hadley 1987).

The Tohono O'odham, formally know as the Papago, have lived in the Sonoran Desert for thousands of years. The desert, although thought by many to be unrelenting in its severe weather conditions, supplied the Papago with their sustenance for many years. In the 1980's the Papago officially changed their name from Papago, which means "Bean Eaters," to Tohono O'odham, which means, "desert people" in their language. The name change reflects the tribe's desire to retain its identity and traditions. The Tohono O'odham belong to the Piman branch of the Uto-Aztecan Linguistic family and are closely related to the Pima tribe. The tribe's territory extended west and southwest across the desert Papagueria and on into Sonora, Mexico. Piman peoples are probably descendents of the prehistoric Hohokam Culture (Mueller, http://web.nmsu.edu/~tomlynch/swlit.tohono.html).

The American border once again saw military activity during the Mexican Revolution in 1910. US soldiers were stationed for the first time on the border at Nogales, Naco and Douglas. By 1916 airplanes were also used to patrol the border establishing the first operational airport in Douglas. The airport would be used off and on until 1929 for planes patrolling the border for the Mexican Revolution and the later Escobar rebellion (Christiansen 1974).

APPENDIX E
NATIONAL REGISTER OF HISTORIC PROPERTIES

Properties Listed on the National Register of Historic Places

Resource Name	Address	City	Multiple
Cochise County, Arizona			
Apache Powder Historic Residential District	100 and 200 Blocks, W. 6th St.	Benson	Benson MPS
Barfoot Lookout Complex	Buena Vista Peak	Portal	National Forest Fire Lookouts in the SW Region TR
Bear Spring House, Guardhouse, and Spring	S of Bowie off Apache Pass Rd.	Bowie	
Benson Railroad Historic District	200 & 300 Blocks, E. 3rd St.	Benson	Benson MPS
Bisbee Historic District	US 80	Bisbee	
Bisbee Woman's Club Clubhouse	74 Quality Hill	Bisbee	
Briscoe, Benjamin E., House	358 N. Bowie	Willcox	Willcox MRA
Cima Park Fire Guard Station	In Chiricahua Wilderness NE of Douglas, Coronado NF	Douglas	Depression-Era USDA Forest Service Administrative Complexes in Arizona MPS
Cochise Hotel	Off U.S. 666	Cochise	
Coronado National Memorial	30 mi. SW of Bisbee	Bisbee	
Council Rocks Archaeological District	Address Restricted	St. David	
Crowley House	175 S. Railroad Ave.	Willcox	Willcox MRA
Double Adobe Site	Address Restricted	Douglas	
Douglas Historic District	Roughly bounded by Pan American, H, and F Ave. along 8th, 10th, 11th, 12th, and 13th St. and G Ave.	Douglas	
Douglas Municipal Airport	E end of 10th Ave.	Douglas	
Douglas Residential Historic District	Roughly bounded by Twelfth St., Carmelita Ave., Seventh St., and East Ave.	Douglas	
Douglas Sonoran Historic District	Roughly bounded by the W side of H Ave. between Sixth and Ninth Sts.	Douglas	
Douglas Underpass	US 80 under Southern Pacific RR, milepost 366.1	Douglas	Vehicular Bridges in Arizona MPS
Douglas, Walter, House	201 Cole Ave.	Bisbee	
Dragoon Springs Stage Station Site	Address Restricted	Dragoon	
El Paso and Southwestern Railroad Passenger Depot--Douglas	Fourteenth St. and H Ave.	Douglas	
El Paso and Southwestern Railroad YMCA	1000 Pan American Ave.	Douglas	

Appendix E: Continued.

Resource Name	Address	City	Multiple
Faraway Ranch Historic District	AZ 181	Dos Cabezas	
Fort Bowie National Historic Site	12 mi. S of Bowie	Bowie	
Fort Huachuca	3.6 mi. W of Sierra Vista	Sierra Vista	
Gadsden Hotel	1046 G. Ave.	Douglas	
Garden Canyon Archeological Site	Address Restricted	Sierra Vista	
Garden Canyon Petroglyphs	Address Restricted	Sierra Vista	
Geronimo Surrender Site	Bluff overlooking Skeleton Canyon, 45 mi. NE of Douglas	Douglas	Warfare Between Indians and Americans in Arizona MPS
Grand Theatre	1139--1149 G. Ave.	Douglas	
Gung'l, John, House	210 S. El Paso Ave.	Willcox	Willcox MRA
Hereford Bridge	Hereford Rd. over the San Pedro River	Hereford	Vehicular Bridges in Arizona MPS
Hi Wo Company Grocery	398 E. 4th St.	Benson	Benson MPS
Hooker Town House	235 E. Stewart	Willcox	Willcox MRA
Johnson--Tillotson House	124 N. Curtis	Willcox	Willcox MRA
Kinjockity Ranch	10047 E. AZ 92	Hereford	
Lehner Mammoth-Kill Site	Address Restricted	Hereford	
Martinez, W. D., General Merchadise Store	180 San Pedro St.	Benson	Benson MPS
Mee, Joe, House	265 W. Stewart	Willcox	Willcox MRA
Monte Vista Lookout Cabin	Monte Vista Peak	Elfrida	National Forest Fire Lookouts in the SW Region TR
Morgan House	2442 E. Maley	Willcox	Willcox MRA
Muheim House	207 Youngblood Ave.	Bisbee	
Naco Border Station	106 D St.	Naco	
Naco-Mammoth Kill Site	Address Restricted	Naco	
Norton, John H., and Company Store	180 N. Railroad Ave.	Willcox	
Oasis Court	363 W. 4th St.	Benson	Benson MPS
Pearce General Store	Ghost Town and Pearce Rd.	Pearce	
Phelps Dodge General Office Building	Copper Queen Plaza, intersection of Main St. and Brewery Gulch	Bisbee	
Portal Ranger Station	Forest Rd. 42A SW of Portal, Coronado NF	Portal	Depression-Era USDA Forest Service Administrative Complexes in Arizona MPS

Appendix E: Continued

Resource Name	Address	City	Multiple
Quiburi	Address Restricted	Fairbank	
Railroad Avenue Historic District	Roughly bounded by Curtis Ave., Stewart St., Southern Pacific RR tracks, and Grant St.	Willcox	Willcox MRA
Redfield--Romine House	146 E. 6th St.	Benson	Benson MPS
Rucker Canyon Archeological District	Address Restricted	Douglas	
Rustler Park Fire Guard Station	SE of Chiricahua NM, Coronado NF	Douglas	Depression-Era USDA Forest Service Administrative Complexes in Arizona MPS
San Bernardino Ranch	17 mi. E of Douglas on the international boundary	Douglas	
Saxon, Harry, House	308 S. Haskell	Willcox	Willcox MRA
Schwertner House	124 E. Stewart St.	Willcox	Willcox MRA (AD)
Sierra Bonita Ranch	SW of Bonita	Bonita	
Silver Peak Lookout Complex	Coronado National Forest	Portal	National Forest Fire Lookouts in the Southwestern Region TR
Smith--Beck House	425 Huachuca St.	Benson	Benson MPS
Soto, Pablo, House	108 E. Stewart	Willcox	Willcox MRA
St. Patrick's Roman Catholic Church	Oak Ave., on Higgins Hill	Bisbee	
St. Paul's Episcopal Church	Safford and 3rd Sts.	Tombstone	
Stafford Cabin	30 mi. SE of Willcox in Chiricahua National Monument	Willcox	
Tombstone City Hall	315 E. Fremont St.	Tombstone	
Tombstone Courthouse	219 E. Toughnut	Tombstone	
Tombstone Historic District	U.S. 80	Tombstone	
Treu, John, House	205 W. Vista, Warren Townsite	Bisbee	
Treu, Max, Territorial Meat Company	305 E. 4th St.	Benson	Benson MPS
US Post Office and Customs House--Douglas Main	601 Tenth St.	Douglas	Historic US Post Offices in Arizona, 1900--1941, TR
Willcox Women's Club	312 W. Stewart	Willcox	Willcox MRA
Wilson, J. C., House	258 E. Maley	Willcox	Willcox MRA
Pima County, Arizona			
Air Force Facility Missile Site 8 (571-7) Military Reservation	1580 W. Duval Mine Rd.	Green Valley	
Air Force Facility Missile Site 8 (571-7) Military Reservation	1580 W. Duval Mine Rd.	Green Valley	
Arizona Inn	2200 E. Elm St.	Tucson	
Armory Park Historic Residential District	E. 12th St. to 19th St., Stone Ave. to 2nd Ave.	Tucson	

Appendix E: Continued

Resource Name	Address	City	Multiple
Armory Park Historic Residential District (Boundary Increase)	Roughly, 19th, 20th, and 21st Sts. from Stone Ave. to Jacobs Ave.	Tucson	
Barrio Libre	Bounded by 14th, 19th, Stone and Osborne Sts.	Tucson	
Bates Well Ranch	Bates Well Rd. E side	Ajo	
Blixt--Avitia House	830 W. Alameda St.	Tucson	Menlo Park MPS
Boudreaux--Robison House	101 N. Bella Vista Dr.	Tucson	Menlo Park MPS
Bray--Valenzuela House	203 N. Grande Ave.	Tucson	Menlo Park MPS
Bull Pasture	E of Lukeville on Organ Pipe Cactus National Monument	Lukeville	
Cannon, Dr. William Austin, House	1189 E. Speedway	Tucson	
Cavalry Corrals	N. Craycroft Blvd.	Tucson	Fort Lowell MRA
Cienega Bridge	5.3 mi. SE of Vail on Marsh Station Rd.	Vail	Vehicular Bridges in Arizona MPS
Cocoraque Butte Archeological District	Address Restricted	Tucson	
Colonia Solana Residential Historic District	Roughly bounded by Broadway Blvd., S. Randolph Way, Camino Campestre, and S. Country Club	Tucson	
Colossal Cave Preservation Park Historic District	Jct. of Old Spanish Trail and Colossal Cave Rd.	Vail	
Copper Bell Bed and Breakfast	25 N. Westmoreland Ave.	Tucson	Menlo Park MPS
Cordova House	173--177 N. Meyer Ave.	Tucson	
Coronado Hotel	410 E. 9th St.	Tucson	
Desert Laboratory	W of Tucson off W. Anklam Rd. on Tumamoc Hill	Tucson	
Dodson--Esquivel House	1004 W. Alameda St.	Tucson	Menlo Park MPS
Dos Lomitas Ranch	Organ Pipe NM	Ajo	
El Camino Del Diablo	NW of Lukeville	Lukeville	
El Conquistador Water Tower	Broadway and Randolph Way	Tucson	
El Encanto Apartments	2820 E. Sixth St.	Tucson	
El Encanto Estates Residential Historic District	Roughly bounded by Country Club Rd., Broadway Blvd., Fifth St., and Jones St.	Tucson	
El Montevideo Historic District	3700 and 3800 blocks of streets between Broadway & 5th St.	Tucson	

Appendix E: Continued

Resource Name	Address	City	Multiple
El Presidio Historic District	Roughly bounded by W. 6th, W. Alameda Sts., N. Stone and Granada Aves.	Tucson	
El Tiradito	221 S. Main St.	Tucson	
Empire Ranch	6 mi. E of Greaterville	Greaterville	
Fort Lowell Park	N. Craycroft Blvd.	Tucson	Fort Lowell MRA
Fourth Avenue Underpass	Fourth Ave.	Tuscon	Vehicular Bridges in Arizona MPS
Gachado Well and Line Camp	E of Lukeville in Organ Pipe Cactus National Monument	Lukeville	
Greenway, John and Isabella, House	1 Greenway House Dr.	Ajo	
Growler Mine Area	N of Lukeville	Lukeville	
Gunsight Mountain Archeological District	Address Restricted	Three Points	
Hughes, Sam, Neighborhood Historic District	Roughly bounded by E. Speedway Blvd., N. Campbell Ave., E. 7th St. and N. Bentley Ave.	Tucson	
I'itoi Mo'o--Montezuma's Head and 'Oks Daha--Old Woman Sitting	Organ Pipe NM	Ajo	
Iron Horse Expansion Historic District	Roughly bounded by Eighth St., Euclid Ave., Hughes and Tenth Sts., and N. Fourth and Hoff Aves.	Tucson	
Julian--Drew Building	182 E. Broadway	Tucson	
Kentucky Camp Historic District	Address Restricted	Sonoita	
Lemmon Rock Lookout House	Coronado National Forest	Tucson	National Forest Fire Lookouts in the Southwestern Region TR
Los Robles Archeological District	Address Restricted	Red Rock	Hohokam Platform Mound Communities of the Lower Santa Cruz River Basin c. A.D. 1050--1450 MPS
Lowell Ranger Station	Off Sabino Canyon Rd. NE of Tucson, Coronado NF	Tucson	Depression-Era USDA Forest Service Administrative Complexes in Arizona MPS
Manning Cabin	10 mi. E of Tucson in Saquaro National Monument	Tucson	

Appendix E: Continued

Resource Name	Address	City	Multiple
Manning, Levi H., House	9 Paseo Redondo	Tucson	
Matus, Antonio, House and Property	856 W. Calle Santa Ana	Tucson	
Men's Gymnasium, University of Arizona	E. Fourth St., University of Arizona campus	Tucson	
Milton Mine	NW of Lukeville	Lukeville	
Officer's Quarters	N. Craycroft Blvd.	Tucson	Fort Lowell MRA
Old Adobe Patio	40 W. Broadway	Tucson	
Old Library Building	University of Arizona campus	Tucson	
Old Main, University of Arizona	University of Arizona campus	Tucson	
Pie Allen Historic District	Roughly bounded by N. Euclid Ave., E. 6th St., N. Park Ave., and E. 10th St.	Tucson	
Pima County Courthouse	115 N. Church St.	Tucson	
Post Trader's Store and Riallito House	5425 E. Fort Lowell Rd.	Tucson	Fort Lowell MRA
Post Trader's Storehouse	5354 E. Fort Lowell Rd.	Tucson	Fort Lowell MRA
Quartermaster Storehouse	5479 E. Fort Lowell Rd.	Tucson	Fort Lowell MRA
Quartermaster's Corrals	N. Craycroft Rd.	Tucson	Fort Lowell MRA
Rillito Racetrack--Chute	4502 N. First Ave.	Tucson	
Rincon Mountain Foothills Archeological District	Address Restricted	Tucson	
Ronstadt House	607 N. 6th Ave.	Tucson	
Ronstadt--Sims Adobe Warehouse	911 N. 13th Ave.	Tucson	Spring, John, MRA
Sabedra--Huerta House	1036--1038 N. 13th Ave.	Tucson	Spring, John, MRA
San Pedro Chapel	5230 E. Ft. Lowell Rd.	Tucson	
San Xavier del Bac	9 mi. S of Tucson via Mission Rd.	Tucson	
Santa Ana del Chiquiburitac Mission Site	Address Restricted	Tucson	
Santa Cruz Catholic Church	1220 S. Sixth Ave.	Tucson	
Schwalen--Gomez House	217 N. Melwood Ave.	Tucson	Menlo Park MPS
Site No. HD 13-11	E. Fort Lowell Rd.	Tucson	Fort Lowell MRA
Site No. HD 13-13	E. Fort Lowell Rd.	Tucson	Fort Lowell MRA
Site No. HD 13-4	N. Craycroft Blvd.	Tucson	Fort Lowell MRA
Site No. HD 4-8A	E. Fort Lowell Rd.	Tucson	Fort Lowell MRA
Site No. HD 5-26	5495 E. Fort Lowell Rd.	Tucson	Fort Lowell MRA
Site No. HD 7-0A	5429 E. Fort Lowell Rd.	Tucson	Fort Lowell MRA
Site No. HD 7-13	5531 E. Fort Lowell Rd.	Tucson	Fort Lowell MRA
Site No. HD 9-28	5668 E. Fort Lowell Rd.	Tucson	Fort Lowell MRA
Site Nos. HD 12-4/12-8	E. Fort Lowell Rd.	Tucson	Fort Lowell MRA
Site Nos. HD 5-28/5-25	3031 N. Craycroft Blvd.	Tucson	Fort Lowell MRA

Appendix E: Continued

Resource Name	Address	City	Multiple
Site Nos. HD 9-11/9-2	5651 E. Fort Lowell Rd.	Tucson	Fort Lowell MRA
Sixth Avenue Underpass	Sixth Ave.	Tucson	Vehicular Bridges in Arizona MPS
Smith, Professor George E. P., House	1195 E. Speedway	Tucson	
Sosa--Carrillo--Fremont House	145--153 S. Main St.	Tucson	
Southern Pacific Railroad Locomotive No. 1673	Himmel Park	Tucson	
Speedway--Drachman Historic District	Roughly bounded by Lee St., Park Ave., Speedway Blvd., 7th Ave., Drachman St., and 2nd Ave.	Tucson	
Spring, John, Neighborhood Historic District	Roughly bounded by W. Speedway Blvd., N. Ninth Ave., W. Fifth St., N. Main Ave., W. Second St., and N. Tenth St.	Tucson	Spring, John, MRA
Stone Avenue Underpass	Stone Ave.	Tucson	Vehicular Bridges in Arizona MPS
Sutherland Wash Archeological District	Address Restricted	Tucson	
Sutherland Wash Rock Art District	Address Restricted	Tucson	
U.S. Post Office and Courthouse	55 E. Broadway	Tucson	
University Heights Elementary School	1201 N. Park Ave.	Tucson	
University of Arizona Campus Historic District	Roughly bounded by E. Second St., N. Cherry Ave., E. Fourth St., and Park Ave.	Tuscon	
Upper Davidson Canyon Archeological District	Address Restricted	Sonoita	
USDA Tucson Plant Materials Center	3241 N. Romero Rd.	Tucson	
Valencia Site (BB:13:15;BB:13:74)	Address Restricted	Tucson	
Velasco House	471--475--477 S. Stone Ave. and 522 S. Russell St.	Tucson	
Ventana Cave	Address Restricted	Santa Rosa	
Victoria Mine	N of Lukeville	Lukeville	
Warner, Solomon, House and Mill	350 S. Grand Ave.	Tucson	
West University Historic District	Roughly bounded by Speedway Blvd., 6th St., Park and Stone Aves.	Tucson	
Wright, Harold Bell, Estate	850 N. Barbara Worth	Tucson	
Santa Cruz County, Arizona			
10 Cottages on Short Street	117--126 Short	Nogales	Nogales MRA

Appendix E: Continued

Resource Name	Address	City	Multiple
Arizona-Sonora Manufacturing Company Machine Shop	Grand Ave. at Arroyo Blvd.	Nogales	Nogales MRA
Atascosa Lookout House	Coronado National Forest	Tubac	National Forest Fire Lookouts in the Southwestern Region TR
Bowman Hotel	314--316 Grand Ave.	Nogales	Nogales MRA
Bowman, W. G., House	112 Sierra	Nogales	Nogales MRA
Burton Building	322--324 Grande	Nogales	Nogales MRA
Cady Hall	346 Duquesne St.	Patagonia	
Calabasas	N of Nogales	Nogales	
Miller, Hugo, House	750 Petrero	Nogales	Nogales MRA
Montezuma Hotel	217 Morley	Nogales	Nogales MRA
Nogales Electric Light, Ice & Water Company Power House	498 Grand	Nogales	Nogales MRA
Nogales High School	209 Plum	Nogales	Nogales MRA
Nogales Steam Laundry Building	223--219 East	Nogales	Nogales MRA
Noon, A. S., Building	246 Grande	Nogales	Nogales MRA
Old Nogales City Hall and Fire Station	223 Grand Ave.	Nogales	Nogales MRA (AD)
Old Tubac Schoolhouse	Address unknown	Tubac	
Pennington Rural Historic Landscape	N of jct. of Royal Rd. and Calle Del Rio	Nogales	
Piscorski, Jose, Building	315 Morley	Nogales	Nogales MRA
Ruby	N of U.S./Mexico border between Ruby and Montana peaks	Ruby and Vicinity	
Santa Cruz Bridge No. 1	South River Rd. over the Santa Cruz River	Nogales	Vehicular Bridges in Arizona MPS
Santa Cruz County Courthouse	Court and Morley Sts.	Nogales	
Three Mediterranean Cottages on Pajarito Street	102--104 Pajarito	Nogales	Nogales MRA
Tubac Presidio	Broadway and River Rd.	Tubac	
Tubac Townsite Historic District	Roughly bounded by Tubac and Plaza Rds. and Presidio Dr.	Tubac	Tubac Settlement MPS
Tumacacori Museum	Tumacacori National Monument	Tumacacori	
Tumacacori National Monument	18 mi. N of Nogales on I 19	Tumacacori	
US Custom House	Jct. of International and Terrace Sts.	Nogales	Nogales MRA
US Post Office and Immigration Station--Nogales Main	Hudgin St. and Morley Ave.	Nogales	Historic US Post Offices in Arizona, 1900--1941, TR
Wise, J. E., Building	134 Grande	Nogales	Nogales MRA

Appendix E: Continued

Resource Name	Address	City	Multiple
Yuma County, Arizona			
Resource Name	Address	City	Multiple
Antelope Hill Highway Bridge	NW of Tacna spanning the Gila River	Tacna	Vehicular Bridges in Arizona MPS (AD)
Balsz House	475 2nd Ave.	Yuma	Yuma MRA
Blaisdell Slow Sand Filter Washing Machine	N. Jones St.	Yuma	
Canelo Ranger Station	Forest Rd. 52B N of Canelo, Coronado NF	Canelo	Depression-Era USDA Forest Service Administrative Complexes in Arizona MPS
Canelo School	18 mi. SE of Sonoita on AZ 93	Canelo	
Cranz, Frank F., House	408 Arroyo	Nogales	Nogales MRA
Crawford Hill Historic Residential District	Roughly bounded by Oak St., Terrace Ave., Compound St., & Interstate 19 & Grindell	Nogales	Nogales MRA
Dunbar, George, House	118 Sierra	Nogales	Nogales MRA
Finley, James, House	7.2 mi. SW of Patagonia in Coronado National Forest	Patagonia	
Guevavi Mission Ruins	6 mi. N of U.S.-Mexican border	Nogales	
Harrison, Sen. James A., House	449 Morley	Nogales	Nogales MRA
Hotel Blanca	701 Morley	Nogales	Nogales MRA
House at 220 Walnut Street	220 Walnut St.	Nogales	Nogales MRA
House at 334--338 Walnut Street	334--338 Walnut St.	Nogales	Nogales MRA
House at 665 Morley Avenue	665 Morley Ave.	Nogales	Nogales MRA
Kentucky Camp Historic District	Address Restricted	Coronado National Forest	
Kitchen, Pete, Ranch	3.5 mi. N of Nogales off U.S. 89	Nogales	
Kress, S. H., & Co., Building	119--121 Morley	Nogales	Nogales MRA
Las Dos Naciones Cigar Factory	331 Morley	Nogales	Nogales MRA
Marsh Heights Historic District	Roughly bounded by Court St., Summit Ave., S. Court St., and Morley Ave.	Nogalez	Nogales MRA
Marsh, George B., Building	213--225 Grand	Nogales	Nogales MRA
Mediterranean Style House	124 Walnut	Nogales	Nogales MRA

Appendix E: Continued

Resource Name	Address	City	Multiple
Mediterranean Style House	116 Walnut	Nogales	Nogales MRA
Brinley Avenue Historic District	29-96 W. 2nd St., 198-200 S. Main, 201 S. 1st, and 102-298 Madison Aves.	Yuma	Yuma MRA
Brown House	268 S. 1st Ave.	Yuma	Yuma MRA
Brownstetter House	627 Orange Ave.	Yuma	Yuma MRA
Cactus Press--Plaza Paint Building	30--54 E. Third St.	Yuma	Yuma MRA
Caruthers House	441 2nd Ave.	Yuma	Yuma MRA
Connor House	281 S. 1st Ave.	Yuma	Yuma MRA
Double Roof House	553 4th Ave.	Yuma	Yuma MRA
Dressing Apartments	146 1st Ave.	Yuma	Yuma MRA
El Camino Del Diablo	NW of Lukeville	Lukeville	
Ewing, Frank, House	700 2nd Ave.	Yuma	Yuma MRA
Ewing, Ruth, House	712 2nd Ave.	Yuma	Yuma MRA
Fourth Avenue Junior High School	450 S. 4th Ave.	Yuma	Yuma MRA
Fredley Apartments	406 2nd Ave.	Yuma	Yuma MRA
Fredley House	408 2nd Ave.	Yuma	Yuma MRA
Gandolfo Theater	200 S. 1st Ave.	Yuma	Yuma MRA
Griffin, Alfred, House	641 1st Ave.	Yuma	Yuma MRA
Harquahala Peak Observatory	E of Wenden off U.S. 60	Wenden	
Hodges, Peter B., House	209 Orange Ave.	Yuma	Yuma MRA
Hotel del Ming	300 Gila St.	Yuma	Yuma MRA
Jackson, E.B., House	572 1st Ave.	Yuma	Yuma MRA
Kent, Jerry, House	450 3rd Ave.	Yuma	Yuma MRA
Lee Hotel	390 Main St.	Yuma	Yuma MRA
Levy, Henry, House	602 2nd Ave.	Yuma	Yuma MRA
Marable, George, House	482 Orange Ave.	Yuma	Yuma MRA
Martinez Lake Site (AZ-050-0210)	Address Restricted	Fisher's Landing	
Masonic Temple	153 S. 2nd Ave.	Yuma	Yuma MRA
Mayhew, Carmelita, House	660 1st Ave.	Yuma	Yuma MRA
McPhaul Suspension Bridge	W of Dome	Dome	Vehicular Bridges in Arizona MPS (AD)
Methodist Episcopal Church	256 S. 1st Ave.	Yuma	Yuma MRA
Methodist Parsonage	248 S. 1st Ave.	Yuma	Yuma MRA
Mexican Consulate	129 W. 4th St.	Yuma	Yuma MRA
Ming, A.B., House	468 Orange Ave.	Yuma	Yuma MRA
Mohawk Valley School	5151 South Ave. 39 East	Roll	
Norton House	226 S. 1st Ave.	Yuma	Yuma MRA
Ocean To Ocean Bridge	Penitentiary Ave	Yuma	Vehicular Bridges in Arizona MPS (AD)

Appendix E: Continued

Resource Name	Address	City	Multiple
Old La Paz	Address Restricted	Ehrenberg	
Old Presbyterian Church	SW of Parker on 2nd Ave.	Parker	
Ortiz House	206 S. 1st Ave.	Yuma	Yuma MRA
Pancrazi House	432 S. Madison Ave.	Yuma	Yuma MRA
Parker Jail	N side of Agency Rd. in Pop Harvey Park	Parker	
Pauley Apartments	490 W. 1st St.	Yuma	Yuma MRA
Power Apartments	20 W. 3rd St.	Yuma	Yuma MRA
Riley, Clara Smith, House	734 2nd Ave.	Yuma	Yuma MRA
Ripley Intaglios	Address Restricted	Ehrenberg	
Roosevelt School	201 6th St.	Yuma	Yuma MRA
Russell-Williamson House	652 2nd Ave.	Yuma	Yuma MRA
San Carlos Hotel	106 1st St.	Yuma	Yuma MRA
San Ysidro Hacienda	Address Restricted	Yuma	
Sears Point Archaeological District	Address Restricted	Gila Bend	
Smith, J. Homer, House	600 5th Ave.	Yuma	Yuma MRA
Southern Pacific Freight Depot	Main St.	Yuma	Yuma MRA
Southern Pacific Railroad Depot	Gila St.	Yuma	
Southern Pacific Railroad Passenger Coach Car--S.P. X7	201 N. 4th Ave.	Yuma	
St. Paul's Episcopal Church	637 2nd Ave.	Yuma	Yuma MRA
Stoffela Store/Railroad Exchange	447 S. Main St.	Yuma	Yuma MRA
US Post Office--Yuma Main	370 W. Third St.	Yuma	Historic US Post Offices in Arizona, 1900--1941, TR
Yuma Century Heights Conservancy Residential Historic District	Roughly bounded by 4th Ave., 8th St., 1st and Orange Aves.	Yuma	
Yuma City Hall	181 W. 1st St.	Yuma	Yuma MRA
Yuma County Courthouse	168 S. 2nd Ave.	Yuma	Yuma MRA
Yuma Crossing and Associated Sites	Banks of the Colorado River	Yuma	
Yuma Main Street Historic District	170--387 S. Main St., 10--29 W. Third St.	Yuma	