

*APPENDIX D*  
*Biological Field Report*





**BIOLOGICAL FIELD SURVEY REPORT**

**SUPPORTING THE**

**ENVIRONMENTAL STEWARDSHIP PLAN**  
**FOR CONSTRUCTION, OPERATION, AND MAINTENANCE**  
**OF TACTICAL INFRASTRUCTURE**  
**U.S. BORDER PATROL TUCSON SECTOR,**  
**NOGALES STATION, ARIZONA**

**May 2008**

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**PREPARED BY:** Gulf South Research Corporation  
8081 GSRI Avenue  
Baton Rouge, LA 70820  
(225) 757-8088  
(225) 761-8077 - fax

**SEGMENTS SURVEYED:** D-5B and D-6

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## 1.0 SUMMARY

The United States (U.S.) Customs and Border Protection (CBP) and the U.S. Border Patrol (USBP) plan to construct, operate, and maintain approximately 7.6 miles of tactical infrastructure (TI) along the U.S./Mexico international border in Santa Cruz County, Arizona, east of the City of Nogales, Arizona. TI will consist of primary pedestrian fence, vehicle fence, construction/maintenance road, and improvements to existing roads within the USBP Tucson Sector. Gulf South Research Corporation (GSRC) was tasked to conduct a 100 percent pedestrian survey to verify the presence of sensitive biological resources present within the project corridor so that CBP can identify and implement measures to best minimize or eliminated impacts of the project to biological resources.

The purpose of this report is to provide site specific findings of biological survey of the project corridor conducted by GSRC on February 14-17 and April 24, 2008. Using the U.S. Fish and Wildlife Services' (USFWS) Information, Planning and Consultation (IPaC) System, 11 Federally listed species were identified as having the potential to occur in the vicinity of the project corridor. These species include Huachuca water umbel (*Lilaeopsis schaffneriana* spp. *recurva*), Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*), Canelo Hills ladies-tresses (*Spiranthes delitescens*), Mexican spotted owl (*Strix occidentalis lucida*), southwestern willow flycatcher (*Empidonax traillii extimus*), Chiricahua leopard frog (*Rana chiricahuensis*), Sonora tiger salamander (*Ambystoma tigrinum*) jaguar (*Panthera onca*), lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*), ocelot (*Leopardus pardalis*), Gila chub (*Gila intermedia*), Sonora chub (*Gila ditaenia*), desert pupfish (*Cyprinodon macularrus*), and Gila topminnow (*Poeciliopsis occidentalis occidentalis*). In addition, the Arizona Natural Heritage Program (ANHP) database noted a total of 68 state listed species are known to occur in Santa Cruz County (ANHP 2008). A comprehensive list of these species is provided in Appendix A.

It must be noted that surveys were not conducted for two of the Federally listed aquatic species known to inhabit the Santa Cruz River: the Gila topminnow and Gila chub. The Planned Action, as will be discussed later, will not affect the stream channel of the Santa Cruz River and, thus, specific surveys for these fishes were not warranted. Therefore, this report makes no determination on the actual occurrence of these fish species within

the project corridor. However, during the surveys, and while searching the Santa Cruz River for the Huachuca water umbel, a visual search for the occurrence of these two fishes was conducted; yet, neither species was observed.

The biological survey resulted in no verifiable occurrences of any Federally or state listed species. However, habitat conditions do exist within the project corridor for all 11 federally listed species.

## **2.0 INTRODUCTION**

The USBP plans to construct a primary pedestrian fence starting 1 mile east of the DeConcini POE and extending eastward for a total of 7.6 miles (Figure 1). Normandy style vehicle fence will be installed within the Santa Cruz River floodplain; bollard-style pedestrian fence will be installed in the repairing portions of the project corridor. The primary pedestrian fence will be installed approximately 3 feet north of the U.S./Mexico border. The vehicle fence will be installed along the border and will be removed prior to each monsoon season. The project corridor surveyed for biological resources began at the international boundary and extended 60 feet to 125 feet north of the boundary.

## **3.0 METHODS AND SURVEY LIMITATIONS**

Prior to the pedestrian survey, GSRC biologists reviewed the National Wetland Inventory (USFWS 2007) maps for the site to determine if wetlands may be present. Appropriate United States Geological Survey (USGS) maps (7½ minute) were reviewed to determine if drainage features, including “blue-line streams” may be present. The National List of Hydric Soils (NCRS 2007) and the Soils Survey for Imperial County were consulted to establish soils associated with the proposed site. The Arizona Ecological Field Services Field Office webpage and USFWS IPaC System was reviewed to determine the occurrence of sensitive species in the vicinity of the planned action.

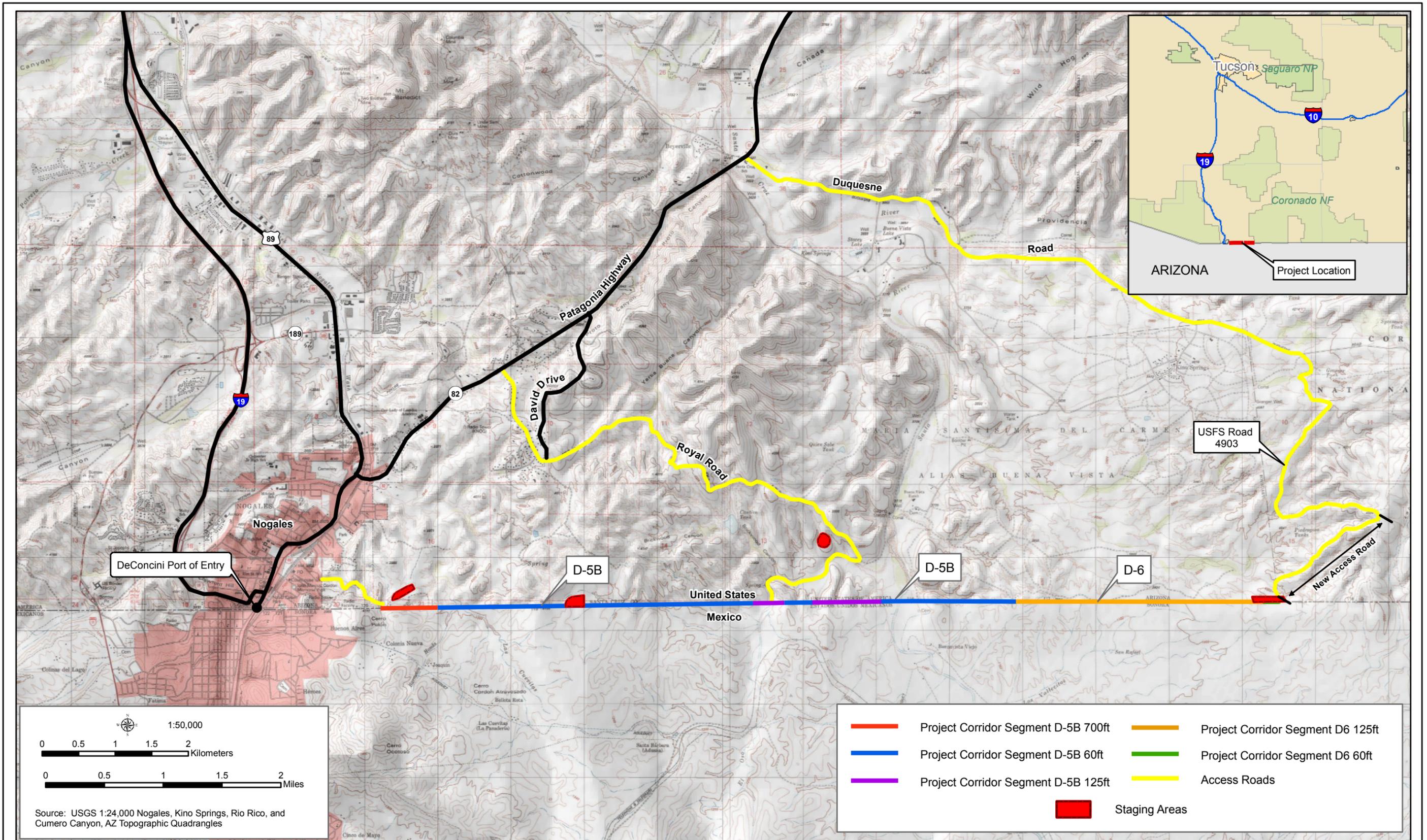


Figure 1: Project Location

Biological field surveys were conducted February 14-17 and April 24, 2008. The project corridor is primarily characterized by a deeply gullied terrain bisected by arroyos. The Santa Cruz River and several smaller tributaries cross the project corridor. Some of these washes contained flowing water during the February biological survey. However, water was only present in the Santa Cruz River during the April survey.

The corridor was examined on foot by slowly walking over the site in a series of transects to provide 100 percent visual coverage of the entire site to assess terrain features and habitats and to search for wildlife sign and protected species. Vegetation and wildlife species observed were recorded as field observations were made. Wildlife sign (scat, bones, feathers, tracks, dens, and burrows) were also recorded as encountered. Frequent pauses were made during the survey to watch and listen for wildlife.

#### **4.0 BIOLOGICAL RESOURCES ASSOCIATED WITH THE PROJECT CORRIDOR**

##### **4.1 Botanical Resources**

Plant communities within the project corridor consist of three Chihuahuan desert communities. The classification of these communities follows Brown (1994) and utilizes variation in general species composition and appearance. The three plant communities are: Interior Southwestern Cotton-Willow Series, and Madrean Evergreen Woodland Series and Scrub-Grassland (Semidesert), Mixed Grass Series. The Interior Southwestern Cotton-Willow Series (Photograph 1) is dominated by Fremont cottonwood (*Populus fremontii*) and narrow-leaf cottonwood (*P. angustifolia*), this series is typically found in open riparian canyons or on bajadas. Vegetation communities of the Cottonwood-Willow series are exposed to full sunlight and warm, dry air. The typical forest structure in this series is an open crowned forest with lower shrub and forb layers. Within the project corridor, this series is limited to the Santa Cruz floodplain and one of its major tributaries and comprises approximately 5 percent of the entire project corridor.

The Riparian Deciduous Forest and Woodland, Mixed Broadleaf Series (Photograph 2) are highly diverse vegetation communities typically associated with riparian canyons and washes. Forest structure consists of a canopy of deciduous broadleaf trees having broad crowns with abundant shrub and forb layers. This series is limited to narrow

bands in moist areas of other washes that bisect the project corridor, and comprises approximately 5 percent of the entire project corridor.



**Photograph 1: Interior Southwestern Cotton-Willow Series**



**Photograph 2: Riparian Deciduous Forest and Woodland, Mixed Broadleaf Series**

The Scrub-Grassland (Semidesert), Mixed Grass Series (Photograph 3) is found on a variety of soils at elevations, this community is the most important grassland series in Arizona and is quite diverse. Native bunch-grasses and fire-tolerant species of this series have suffered from cattle grazing and fire suppression, thus permitting the proliferation of invasive shrubs and cacti. The community is typically made up of shrubs and succulents scattered among mixed stands of perennial bunch-grasses and annual grasses of uniform height. It is the most widely distributed community within the project corridor, and is composed of grassy landscapes broken up by widely scattered scrub trees. This community comprises the remaining 90 percent of the project corridor and 100 percent of the temporary staging areas. The Madrean Evergreen Woodland community occurs in a small isolated pocket west of the Santa Cruz River. In this community, Emory oak (*Quercus emoryi*), Mexican blue oak (*Q. oblongifolia*), and alligator bark juniper (*Juniperus deppeana*) formed an open canopy and contained shrub layer of indigobushes (*Dalea* spp.), buckwheat (*Eriogonum* spp.), and bricklebush (*Brickellia* spp.). The sparse herbaceous layer beneath typically consisted of grasses and did not support leaf succulents or cacti. As with the majority of areas within the project corridor; heavy cattle grazing was evident in this community. Dominant plant species observed during the surveys are listed in Table 1.



**Photograph 3: The Scrub Grassland (Semidesert), Mixed Grass Series**

**Table 1. Plant Species Observed in Project Corridor during the Pedestrian Survey**

<b>Common Name</b>	<b>Scientific Name</b>
Sideoats grama	<i>Bouteloua curtipendula</i>
Arizona threeawn	<i>Aristida arizonica</i>
Slender grama	<i>Bouteloua filiformis</i>
Wooly bunchgrass	<i>Elionurus barbiculmis</i>
Deer grass	<i>Muhlenbergia rigens</i>
Trailing four o'clock	<i>Allionia incarnata</i>
Indigo bush	<i>Dalea sp.</i>
Primrose	<i>Oenothera ssp.</i>
Pepperweed	<i>Lepidium spp.</i>
Fringed amaranth	<i>Amaranthus fimbriatus</i>
Plantain	<i>Plantago ovata</i>
Lupine	<i>Lupinus spp.</i>
Sagebrush	<i>Artemisia ssp.</i>
Goosefoot	<i>Chenopodium ssp.</i>
Buckwheat	<i>Eriogonum ssp.</i>
Locoweed	<i>Astragalus spp.</i>
Beargrass	<i>Nolina microcarpa</i>
Bigelow noloena	<i>Nolina bigelovii</i>
Soaptree yucca	<i>Yucca elata</i>
Spanish dagger	<i>Yucca schottii</i>
Sotol	<i>Sasyllirion wheeleri</i>
Parry's agave	<i>Agave parryi</i>
Ocotillo	<i>Fouquieria splendens</i>
Rainbow cactus	<i>Echinocereus pectinatus</i>
Beehive cactus	<i>Coryphantha spp.</i>
Cholla	<i>Opuntia spp.</i>
Prickly pear	<i>Opuntia engelmannii</i>
Strawberry hedgehog cactus	<i>Echinocereus englemannii</i>
Desert Mariposa lily	<i>Calochortus kennedyi</i>
Devils claw	<i>Proboscidea parviflora</i>
Silverleaf night shade	<i>Solanum elaeagnifolium</i>
Western blue flax	<i>Linum lewisii</i>
Plains flax	<i>Linum puberulum</i>
Range ratany	<i>Krameria parvifolia</i>
Mesquite	<i>Prosopis glandulosa</i>
Catclaw acacia	<i>Mimosa aculeaticarpa var. biuncifera</i>
Emory oak	<i>Quercus emoryi</i>
Fairy duster	<i>Calliandra eriophylla</i>
Cedar	<i>Juniperus communis</i>
Plains lovegrass	<i>Eragrostis intermedia</i>
Willow	<i>Salix spp.</i>
Eastern cottonwood	<i>Populus fremontii</i>
Desertbroom	<i>Baccharis sarothroides</i>
Rush	<i>Juncus spp</i>
White sagebrush	<i>Artemisia ludoviciana</i>
Cane beardgrass	<i>Andropogon bardinodis</i>
Candy barrel cactus	<i>Ferocactus wislizeni</i>
California poppy	<i>Eschscholzia californica ssp. mexicana</i>

Two federally listed plant species were identified as potentially occurring in or near the project corridor (USFWS 2007). Although IPaC identified the Canelo Hills ladies'-tresses as a potential species, this plant does not occur near the project corridor. These are listed in Table 2.

**Table 2. Federally Listed Plant Species with the Potential to occur in the Project Corridor**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Federal Status</b>
Huachuca water umbel	<i>Lilaeopsis schaffneriana</i> spp. <i>recurva</i>	Endangered
Pima pineapple cactus	<i>Coryphantha scheeri</i> var. <i>robustispina</i>	Endangered

(USFWS 2007)

**Huachuca water umbel-** Huachuca water umbel inhabits southwestern New Mexico, southeastern Arizona, and Sonora, Mexico. In Arizona, Huachuca water umbel has been found in three counties. In Cochise County, it has been found in the San Bernadino National Wildlife Refuge, Leslie Canyon National Wildlife Refuge, the Huachuca Mountains, the Babocomari River, the San Pedro River area, and at Saint David. In Santa Cruz County, it has been found near Sonoita Creek, Papago Springs, Canelo Hills/Turkey Creek, on the Audubon Research Ranch, and San Rafael Valley. The Huachuca water umbel, a member of the parsley family, is an herbaceous semi-aquatic perennial.

During the pedestrian field survey, a small population was thought to have been located in the Santa Cruz River; however, after closer examination during a site visit with the USFWS, it was identified to be a species of soft rush (*Juncus* spp.). Although potential habitat for the species does exist within the Santa Cruz River and the project corridor, none were observed during either of the field surveys.

**Pima pineapple cactus-** The Pima pineapple cactus is found at elevations between 2,300 and 4,500 feet in Pima and Santa Cruz Counties (58 CFR 49875). They are found in alluvial basins or on hillsides in semi-desert grassland and Sonoran desertscrub, where the habitats that are flat and sparsely vegetated. Pima pineapple cacti are 4 to 18 inches tall, dome-shaped, with silky yellow flowers that bloom in early July with summer rains (58 CFR 49875).

The project corridor lies in the southernmost portion of the Pima pineapple cacti known range. Suitable habitat for this species occurs within the project corridor, however this species was not observed during the February 14-17, 2008 pedestrian field survey.

#### 4.2 Faunal Resources

Arizona contains an enormous diversity of environments for wildlife ranging from hot, dry deserts at low elevations through rich upland deserts, grasslands, and woodlands at mid-elevations to cold, moist montane/alpine habitats. The native faunal components of southeastern Arizona include 370 species of birds, 109 mammal species (Lowe 1964, Hoffmeister 1986), 23 amphibian species (Lowe 1964, Lowe and Holm 1992), and 72 species of reptiles (Lowe 1964, U.S. Department of Interior [USDOI] 1989, USACE 1990). Fish diversity in the major river basins and springs within the region are relatively low and many species are not native (Minckley 1973; Rinne and Minckley 1991; Robbins et al. 1991). The Santa Cruz River system is known to support 12 fish species. Wildlife species observed during the pedestrian surveys are listed in Table 3.

Nine Federally listed wildlife species were identified as having the potential to occur in or near the project corridor. These are listed in Table 4, followed by brief discussions and survey findings.

**Table 3. Wildlife Species Observed in Project Corridor**

<b>Common Name</b>	<b>Scientific Name</b>
Morning dove	<i>Zenaida macroura</i>
Great horned owl	<i>Bubo virginianus</i>
Gila woodpecker	<i>Melanerpes uropygialis</i>
Northern flicker	<i>Colaptes auratus</i>
California quail	<i>Callipepla californica</i>
Montezuma quail	<i>Cyrtonyx montezumae</i>
Killdeer	<i>Charadrius vociferus</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
Black treated sparrow	<i>Bamphispiza bilineata</i>
Red tailed hawk	<i>Bateo jamaicensis</i>
Verdin	<i>Auriparus flaviceps</i>
Cactus wren	<i>Campylorhynchus brunneicapillus</i>
Northern cardinal	<i>Cardinalis cardinalis</i>
Greater roadrunner	<i>Geococcyx californianus</i>
Black-tailed jackrabbit	<i>Lepus californicus</i>
Coyote	<i>Canis latrans</i>
Cattle	<i>Bos taurus</i>

**Table 4. Federally Listed Wildlife Species with the Potential to Occur in the Project Corridor**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Federal Status</b>
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered
Chiricahua leopard frog	<i>Rana chiricahuensis</i>	Threatened
Jaguar	<i>Panthera onca</i>	Endangered
Lesser long-nosed bat	<i>Leptonycteris curasoae yerbabuena</i>	Endangered
Ocelot	<i>Leopardus pardalis</i>	Endangered
Gila chub	<i>Gila intermedia</i>	Endangered
Gila topminnow	<i>Poeciliopsis occidentalis occidentalis</i>	Endangered

**Mexican spotted owl** - The Mexican spotted owl is a medium-sized owl with large dark eyes and no ear tufts. They occur in varied habitat, consisting of mature montane forest and woodland, shady wooded canyons, and steep canyons. In forested habitat, uneven-aged stands with a high canopy closure, high tree density, and a sloped terrain appear to be key habitat components. Elevation ranges from 4,100 to 9,000 feet. Their present range is thought to be similar to the historical range. Populations in Arizona are patchily distributed and occur where appropriate habitat is present throughout all but the arid southwestern portion of the state. – Critical habitat is designated east of project corridor, within the boundaries of the Coronado National Forest, Sierra Vista District.

While, suitable foraging habitat for this species occurs within the Santa Cruz River watershed, the Mexican spotted owl has not recently been reported along major riparian corridors in Arizona and New Mexico, nor in historically documented areas in southern Mexico (USFWS 1995a). In Arizona, the Mexican spotted owl is patchily distributed in forested mountains statewide (Arizona Game and Fish Department [AGFD] 2001). This species was not observed during the February or April 2008 pedestrian field surveys and suitable habitat, including coniferous forests, are not present within or adjacent to the project corridor.

**Southwestern willow flycatcher** - The southwestern willow flycatcher is found on breeding territories by mid-May; nest building and egg laying typically occur in late May and early June; and fledglings can be found in early to mid-July (Muiznieks *et al.* 1994; Sogge *et al.* 1994). The southwestern willow flycatcher occurs in riparian habitats with dense growths of willows (*Salix* sp.), marsh broom (*Baccharis* sp.), arrowweed (*Pluchea*

sp.), buttonbush (*Cephalanthus* sp.), tamarisk (*Tamarix* sp.), Russian olive (*Eleagnus* sp.), and often with a scattered overstory of cottonwood (*Populus* sp.). These habitats tend to be rare, widely separated, or small, and usually separated by vast expanses of arid lands.

Potential foraging habitat was noted along the Santa Cruz River system north of the project corridor. However, as can be seen from Photographs 1 and 2, the Santa Cruz River and other washes do not provide large blocks of willow-cottonwood forests with dense understory that comprise suitable habitat for this species. Instead, the riparian communities with the project corridor occur as thin bands along the stream banks. In addition, the southwestern willow flycatcher was not observed during the February and April 2008 pedestrian field surveys.

**Chiricahua leopard frog-** One of seven known leopard frogs found in Arizona, the Chiricahua leopard frog is greenish-brown usually with a green face. This species is highly aquatic, living in a variety of water sources including rocky streams with deep rock-bound ponds, river overflow pools, oxbows, permanent springs, stock tanks, and ponds (AGFD 2001). The riparian habitat along these water bodies generally consist of oak and mixed oak and pine woodlands, but it can also range into areas of chaparral, grassland, and even desert.

Potentially suitable habitat may exist in perennial pools of the Santa Cruz River floodplain and its tributaries located within the project corridor. However no frogs (of any species) were observed or heard during the February or April 2008 pedestrian field survey

**Jaguar-** The jaguar is the largest and most robust of the North American cats. The southwestern U.S. and Sonora, Mexico are the extreme northern limits of the jaguar's range, which primarily extends from central Mexico, then south through Central and South America to northern Argentina (Hatten *et al.* 2002). The jaguar is found near water in the warm tropical climate of savannahs and forests. Individuals have been sighted in mountainous areas in southeastern Arizona, including the Pajarito Mountains west of Nogales (AGFD 2004). Information on jaguar ecology and behavior, especially at the northern edge of the species' range, is very limited. Habitat studies in the core

part of their range indicate a close association with water, dense cover, and sufficient prey, and an avoidance of highly disturbed areas (Hatten *et al.* 2002). Jaguar distribution patterns over the last 50 years suggest that southeast Arizona is the most likely area for future jaguar occurrence in the U.S. (Hatten *et al.* 2002). According to AGFD the nearest known Mexican population occurs approximately 135 miles south of Tucson, Arizona (AGFD 1998a).

Jaguar home ranges are highly variable, depending on the topography, prey abundance, and the population density of the cats (Brown and Lopez Gonzalez 2001). While suitable habitat for this species occurs within the project corridor site, there are no known breeding populations in the U.S. Jaguars may cross into Texas, New Mexico, and Arizona from adjacent Mexico (AGFD 1998). This species was not observed during the February or April 2008 pedestrian field surveys.

**Lesser long-nosed bat**- The lesser long-nosed bat was listed as endangered on September 30, 1988 (53 FR 38456). Lesser long-nosed bats are a nectar, pollen, and fruit-eating species that migrate into southern New Mexico and Arizona seasonally from Mexico (AGFD 2003) (Photograph 3-4). Lesser long-nosed bats migrate, beginning in early April, apparently following the flowering of columnar cacti and desert agave (*Agave deserti simplex*), then returning to Mexico during September (USFWS 1995). The lesser long-nosed bat is found during the summer within desert grasslands and scrublands (AGFD 2003). Roosting occurs in caves, abandoned buildings, and mines, which are usually located at the base of mountains where food sources are present (AGFD 2003). The recovery plan for the lesser long-nosed bat was completed in March 1997. Scattered small agave plants were present within the project corridor, and could provide potential foraging habitat. Roosting areas are known to occur within the region.

Scattered small agave plants were present within the project corridor, and could provide potential foraging habitat. Roosting areas are also known to occur within the region. While foraging habitat was found in the project corridor, no suitable roosting habitats were identified for this species within the project corridor. Furthermore, limited presence of scattered agaves reduces the potential for lesser long-nosed bat to utilize the project corridor, other than as an infrequent transit corridor to more suitable habitat .

**Ocelot-** The ocelot is a medium-sized cat measuring 30 to 41 inches and weighing 15 to 40 pounds (AGFD 1998b). In Arizona, the ocelot is believed to inhabit Sonoran Desertscrub communities. Little is known of the ocelot in Arizona, but reports of ocelots in southeastern Arizona warrant further investigation of its status in Arizona and northern Sonora (USFWS 1990). Since 1980, four ocelots have been inadvertently trapped in Arizona: two from the San Pedro Valley, one from the Holbrook-Concho area, and one from Sasabe (USFWS 1990). Sightings have been reported in Maricopa County, Arizona, but these are probably due to escaped or released captive animals (USFWS 1990).

Potentially suitable habitat exists in densely vegetated areas of the Santa Cruz River floodplain and its tributaries within the project corridor. However no evidence (e.g. tracks or scat) of this species, nor any other cats, were observed during the February or April 2008 pedestrian field survey.

**Gila chub-** The Gila chub is a small-finned, deep-bodied, member of the minnow family that ranges 6 to 8 inches in length. They commonly inhabit pools in smaller streams, cienegas, and artificial impoundments ranging in elevation from 609 to 1,676 m (2,000 to 5,500 ft). Their historic range was throughout the entire Gila River basin, with the possible exception of the Salt River drainage above Roosevelt Lake. Presently they occur in tributaries of the Agua Fria, Babocomari, Gila, San Francisco, San Pedro, Santa Cruz, and upper Verde rivers in Cochise, Coconino, Gila, Graham, Greenlee, Pima, Pinal, Santa Cruz, and Yavapai counties, Arizona, and in Grant County, New Mexico.

Potentially suitable habitat exists in the Santa Cruz River system within the project corridor. However, this species was not visually observed during the February 2008 pedestrian field survey. No aquatic surveys were conducted for this species.

**Gila topminnow-** The Gila topminnow is a small, 1-2 in long, guppy-like, live-bearing fish that occurs in small streams, springs, and cienegas below 4,500 feet elevation. Their historic range was throughout the Gila River drainage in Arizona and also into Mexico and New Mexico. Presently they only occur in Mexico and Arizona. In Arizona, most of the remaining native populations are in the Santa Cruz River system.

Potentially suitable habitat exists in the Santa Cruz River system within the project corridor. However this species was not visually observed during the February 2008 pedestrian field survey. No aquatic surveys were conducted for this species.

#### **4.3 Wetlands and other Jurisdictional Waters**

Waters of the U.S. (WUS) are defined as, and may include, 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. Jurisdictional boundaries for WUS are defined in the field as the ordinary high water marks 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.

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

During the pedestrian survey of the project corridor, GSRC identified 27 potential surface water crossings that bisect the project corridor. The total acreage of these crossings was an estimated 1.0 total acres. Figure 2 identifies all of the potential surface water crossings located within the project corridor. All of these streams are likely to be considered as jurisdictional WUS by the USACE-Los Angeles District, Arizona/Nevada Area Office.

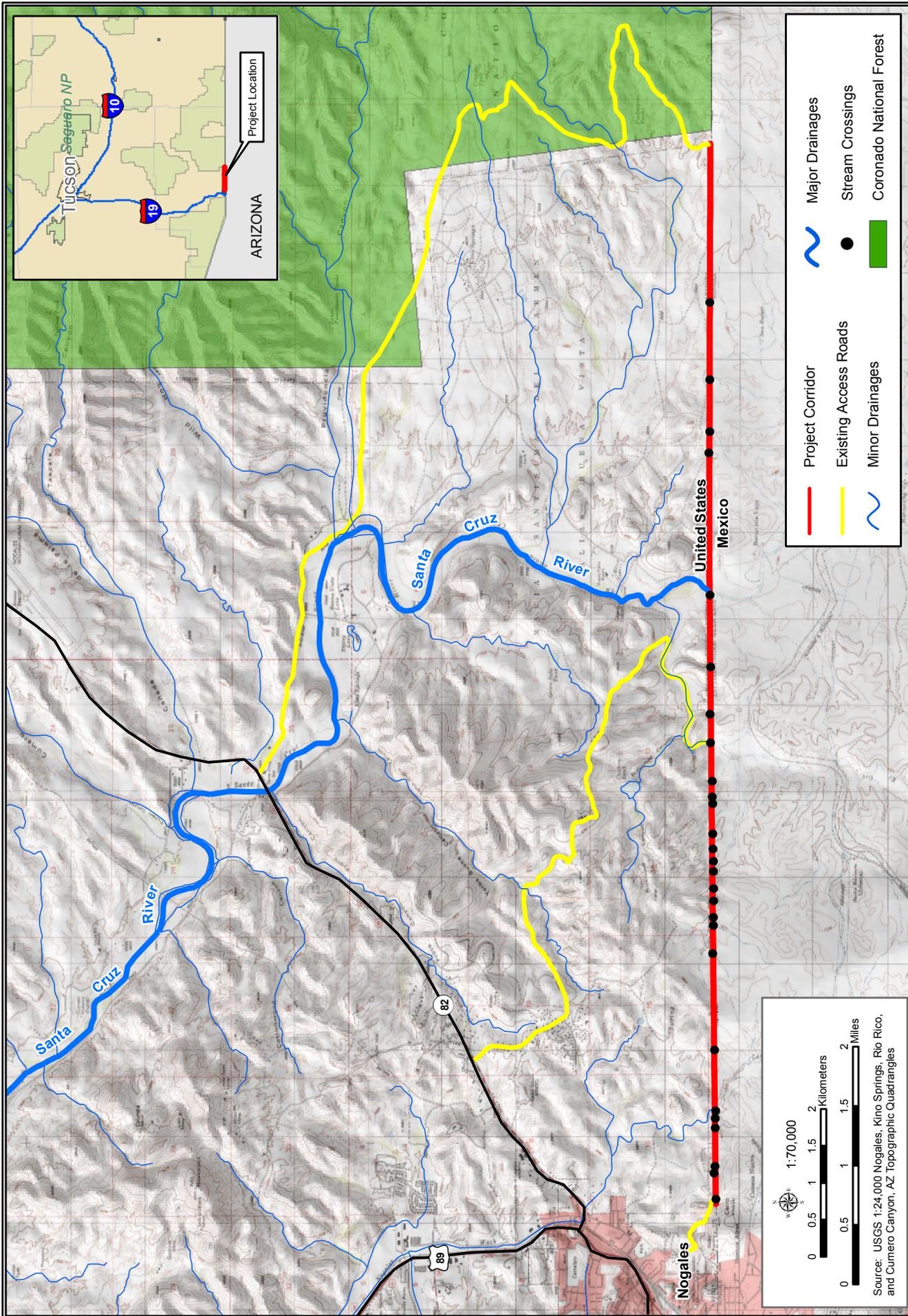


Figure 2: Surface Waters and Waters of the U.S.

## 5.0 DISCUSSION

Eleven federally listed species were initially identified as potentially occurring in the vicinity of the project. After field assessments were performed it was determined that suitable habitat is present for all of these species. However, neither of the two plant species were observed in spite of intensive field investigations. These species and the results of surveys are provided in Table 5.

**Table 5. Summary of listed species potentially occurring in the project area**

<b>Common Name</b>	<b>Potential to occur</b>	<b>Basis of determination</b>
Huachuca water umbel	NO	None observed within the project corridor
Pima pineapple cactus	NO	None observed within the project corridor
Mexican spotted owl	YES	Suitable habitat species occurs within the Santa Cruz River floodplain of the proposed project corridor as forested and steep sloped terrain do exist in portions of the floodplain.
Southwestern willow flycatcher	YES	Potential foraging and nesting habitat was noted along the Santa Cruz River system of the project corridor.
Chiricahua leopard frog	YES	Suitable habitat may exist in perennial pools of the Santa Cruz River floodplain
Jaguar	YES	Jaguar home ranges are highly variable, depending on the topography, prey abundance, and the population density of the cats
Lesser long-nosed bat	YES	Scattered small agave plants were present within Foraging habitat was found in the project corridor, yet the potential for this species to occur is likely limited to an infrequent transit corridor to more suitable habitat .
Ocelot	YES	Suitable habitat exists in densely vegetated areas of the Santa Cruz River floodplain and its tributaries within the project corridor.
Gila chub	YES	No aquatic surveys performed.
Gila topminnow	YES	No aquatic surveys performed.

NA- Not assessed potential (occurrence is assumed)

**6.0 Certification:**

I hereby certify that the statements furnished above and in the Appendix exhibits present the data and information required for this biological survey, and that the facts, statements, and information presented are true and correct to the best of my knowledge and belief. Field surveys were conducted by myself (James Henderson) and Sara Viernum. We certify that we have not signed a non-disclosure or consultant confidentiality agreement with the project applicant or applicant's representative and that we have no financial interest in the project.

DATE: 27 June 2008 SIGNED:   
PROJECT MANAGER - GSRC

**FIELD SURVEYS AND REPORT WERE PREPARED BY:**

**JAMES HENDERSON (WILDLIFE BIOLOGIST) - GSRC**

**SARA VIERNUM (WILDLIFE BIOLOGIST) – GSRC**

**JOSH MCENANY (WILDLIFE BIOLOGIST) – GSRC**

**MICHAEL HODSON (WILIFE BIOLOGIST) – GSRC**

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## Appendix A

**Appendix A. State of Arizona Wildlife Species of Concern**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>
Sonora Tiger Salamander	<i>Ambystoma tigrinum stebbinsi</i>	WSC
Western Barking Frog	<i>Eleutherodactylus augusti cactorum</i>	WSC
Great Plains Narrow-mouthed Toad	<i>Gastrophyne olivacea</i>	WSC
Chiricahua Leopard Frog	<i>Rana chiricahuensis</i>	WSC
Tarahumara Frog	<i>R. tarahumarae</i>	WSC
Lowland Leopard Frog	<i>R. yavapaiensis</i>	WSC
Northern Goshawk	<i>Accipiter gentilis</i>	WSC
Violet-crowned Hummingbird	<i>Amazilia violiceps</i>	WSC
Baird's Sparrow	<i>Ammodramus bairdii</i>	WSC
Sprague's Pipit	<i>Anthus spragueii</i>	WSC
Northern Gray Hawk	<i>Buteo nitidus maxima</i>	WSC
Common Black Hawk	<i>Buteogallus anthracinus</i>	WSC
Western Yellow-billed Cuckoo	<i>Coccyzus americanus occidentalis</i>	WSC
Black-bellied Whistling Duck	<i>Dendrocygna autumnalis</i>	WSC
Southwest Willow Flycatcher	<i>Empidonax traillii extimus</i>	WSC
American Peregrine Falcon	<i>Falco peregrinus anatum</i>	WSC
Cactus ferruginous Pygmy-owl	<i>Glaucidium brasilianum cactorum</i>	WSC
Bald Eagle (wintering pop.)	<i>Haliaeetus leucocephalus</i>	WSC
Rose-throated Becard	<i>Pachyramphus aglaiae</i>	WSC
Osprey	<i>Pandion haliaetus</i>	WSC
Black-capped Gnatcatcher	<i>Polioptila nigriceps</i>	WSC
Mexican Spotted Owl	<i>Strix occidentalis lucida</i>	WSC
Elegant Trogon	<i>Trogon elegans</i>	WSC
Thick-billed Kingbird	<i>Tyrannus crassirostris</i>	WSC
Tropical Kingbird	<i>T. melancholicus</i>	WSC
Desert Pupfish	<i>Cyprinodon macularius</i>	WSC
Sonora Chub	<i>Gila ditaenia</i>	WSC
Gila Chub	<i>G. intermedia</i>	WSC
Gila Topminnow	<i>Poeciliopsis occidentalis occidentalis</i>	WSC
Mexican Long-tongued Bat	<i>Choeronycteris mexicana</i>	WSC
Western Red Bat	<i>Lasiurus blossevillii</i>	WSC
Lesser Long-nosed Bat	<i>Leptonycteris curasoae yerbabuenae</i>	WSC
California Leaf-nosed Bat	<i>Macrotus californicus</i>	WSC
Jaguar	<i>Panthera onca</i>	WSC

<b>Common Name</b>	<b>Scientific Name</b>	<b>Status</b>
Arizona Shrew	<i>Sorex arizonae</i>	WSC
Pima Indian Mallow	<i>Abutilon parishii</i>	SR
Santa Cruz Striped Agave	<i>Agave parviflora</i> spp. <i>parviflora</i>	HS
Redflower Onion	<i>Allium rhizomatum</i>	SR
Saiya	<i>Amoreuxia gonzalezii</i>	HS
Huachuca Milk-vetch	<i>Astragalus hypoxylus</i>	SR
Santa Cruz Beehive Cactus	<i>Coryphantha recurvata</i>	HS
Pima Pineapple Cactus	<i>C. scheeri</i> var. <i>robustispina</i>	HS
Gentry Indigo Bush	<i>Dalea tentaculoides</i>	HS
Woodland Spruge	<i>Euphorbia macropus</i>	SR
Bartram Stonecrop	<i>Graptopetalum bartramii</i>	SR
Chisos Coral-root	<i>Hexalectris revolute</i>	SR
Crested Coral-root	<i>H. spicata</i>	SR
Huachuca Water Umble	<i>Lilaeopsis schaffneriana</i> var. <i>recurva</i>	HS
Lemmon Lily	<i>Lilium parryi</i>	SR
Leafy Lobelia	<i>Lobelia fenestralis</i>	SR
Mexican Lobelia	<i>L. laxiflora</i>	SR
Supine Bean	<i>Macroptilium supinum</i>	SR
Madrean Adder's Mouth	<i>Malaxis corymbosa</i>	SR
Purple Adder's Mouth	<i>M. porphyrea</i>	SR
Wilcox Fishhook Cactus	<i>Mammillaria wrightii</i> var. <i>wilcoxii</i>	SR
Stag-horn Cholla	<i>Opuntia versicolor</i>	SR
Catalina Beardtongue	<i>Penstemon discolor</i>	HS
Whisk Fern	<i>Psilotum nudum</i>	HS
Fallen Ladies'-tresses	<i>Schiedeella arizonica</i>	SR
Huachuca Groundsel	<i>Senecio multidentatus</i> var. <i>huachucanus</i>	HS
Madrean Ladies'-tresses	<i>Spiranthes delitescens</i>	HS
Michoacan Ladies'-tresses	<i>Stenorrhynchos</i> <i>michuacanum</i>	SR
Pinos Altos Flame Flower	<i>Talinum humile</i>	HS
Tepic Flame Flower	<i>T. marginatum</i>	SR
Arizona Ridge-nosed Rattlesnake	<i>Crotalus willardi willardi</i>	WSC
Sonoran Desert Tortoise (Sonoran Population)	<i>Gopherus agassizii</i>	WSC
Brown Vinesnake	<i>Oxybelis aeneus</i>	WSC
Northern Mexican Gartersnake	<i>Thamnophis eques</i> <i>megalops</i>	WSC

Source: ANHP 2008. Definitions: WSC: Wildlife Species of Concern; HS: Highly Safeguarded; SR: Salvage Restricted;