

APPENDIX B
Biological Resources Plan



BIOLOGICAL RESOURCES PLAN
FOR
CONSTRUCTION, OPERATION, AND MAINTENANCE
OF TACTICAL INFRASTRUCTURE
FOR
TUCSON SECTOR, ARIZONA

NOGALES STATION



U.S. DEPARTMENT OF HOMELAND SECURITY
U.S. CUSTOMS AND BORDER PROTECTION
U.S. BORDER PATROL TUCSON SECTOR

Prepared by



AUGUST 2008

ABBREVIATIONS AND ACRONYMS

BMP	Best Management Practice
BRP	Biological Resources Plan
CBP	U.S. Customs and Border Protection
CITES	Convention of International Trade in Endangered Species
cm	centimeters
dBA	A-weighted decibels
DHS	U.S. Department of Homeland Security
ESA	Endangered Species Act
FR	Federal Register
GIS	Geographic Information System
GPS	Global Positioning System
IIRIRA	Illegal Immigration Reform and Immigrant Responsibility Act
km	kilometers
mm	millimeters
mph	miles per hour
PAC	Protected Activity Center
PCE	Primary Constituent Element
POE	Port of Entry
PV-1	Personnel-Vehicle Fence Type-1
USACE	U.S. Army Corps of Engineers
USBP	U.S. Border Patrol
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
VF-2	Vehicle Fence Type-2

EXECUTIVE SUMMARY

The U.S. Department of Homeland Security (DHS), Customs and Border Protection (CBP), U.S. Border Patrol (USBP) plans to construct, operate, and maintain tactical infrastructure consisting of primary pedestrian and vehicle fencing, and supporting patrol and access roads and other infrastructure in two sections along the U.S./Mexico international border in Santa Cruz County, Arizona.

Table ES-1 outlines federally listed species and federally designated critical habitats known to occur or to potentially occur within or adjacent to the Project area and the determination of effects resulting from the Project.

Of the species listed in **Table ES-1**, the Project may affect the jaguar (*Panthera onca*) and lesser long-nosed bat (*Leptonycteris curasonae*) in areas associated with Sections D-5B and D-6.

The Project may affect, but is not likely to adversely affect, the Huachuca water-umbel (*Lilaeopsis schaffneriana* ssp. *Recurva*), Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*), Gila topminnow (*Poeciliopsis occidentalis occidentalis*), Chiricahua leopard frog (*Rana chiricahuensis*), and ocelot (*Leopardus pardalis*) in areas associated with Sections D-5B and D-6.

The remaining federally listed species, the Canelo Hills ladies' tresses (*Spiranthes delitescens*), Stephan's riffle beetle (*Hetrelmis stephani*), Huachuca springsnail (*Pyrgulopsis thomsoni*), desert pupfish (*Cyprinodon macularius*), Gila chub (*Gila intermedia*), Sonora chub (*Gila ditaenia*), Sonora tiger salamander (*Ambystoma tigrinum stebbinsi*), Mexican spotted owl (*Strix occidentalis lucida*), southwestern willow flycatcher (*Empidonax traillii extimus*), and yellow-billed cuckoo (*Coccyzus americanus*) will not be affected by the Project; and therefore, will not be discussed in this Biological Resources Plan (BRP).

On April 1, 2008, the Secretary of DHS, pursuant to his authority under Section 102(c) of the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA), exercised his authority to waive certain environmental and other laws in order to ensure expeditious construction of tactical infrastructure along the U.S./Mexico international border. Although the Secretary's waiver means that CBP no longer has any specific legal obligations under these laws, the Secretary committed the Department to responsible environmental stewardship of our valuable natural and cultural resources. CBP strongly supports this objective and remains committed to being a good steward of the environment. To that end, CBP has prepared the following BRP, which analyzes the potential impacts on threatened and endangered species associated with construction of tactical infrastructure in the USBP's Tucson Sector. The BRP also discusses CBP's plans as to how potential impacts on threatened and endangered species can be mitigated. The BRP will help to guide CBP's efforts going forward.

Table ES-1. Determination of Effects on Federally Listed and Candidate Species within Sections D-5B and D-6

Species	Listing Status	Determination
PLANTS		
Canelo Hills ladies'-tresses, <i>Spiranthes delitescens</i>	Endangered	No effect
Huachuca water-umbel, <i>Lilaeopsis schaffneriana</i> ssp. <i>Recurva</i>	Endangered	Not likely to adversely affect
Pima pineapple cactus, <i>Coryphantha scheeri</i> var. <i>robustispina</i>	Endangered	Not likely to adversely affect
INVERTEBRATES		
Stephan's riffle beetle, <i>Hetrelmis stephani</i>	Candidate	No effect
Huachuca springsnail, <i>Pyrgulopsis thomsoni</i>	Candidate	No effect
FISH		
Desert pupfish, <i>Cyprinodon macularius</i>	Endangered	No effect
Gila chub, <i>Gila intermedia</i>	Endangered	No effect
Gila topminnow, <i>Poeciliopsis occidentalis</i> <i>occidentalis</i>	Endangered	Not likely to adversely affect
Sonora chub, <i>Gila ditaenia</i>	Threatened	No effect
AMPHIBIANS		
Chiricahua leopard frog, <i>Rana chiricahuensis</i>	Threatened	Not likely to adversely affect
Sonora tiger salamander, <i>Ambystoma tigrinum stebbinsi</i>	Endangered	No effect
BIRDS		
Mexican spotted owl, <i>Strix occidentalis lucida</i>	Threatened, with critical habitat designated east of the project corridor	No effect
Southwestern willow flycatcher, <i>Empidonax traillii extimus</i>	Endangered	No effect
Yellow-billed cuckoo, <i>Coccyzus americanus</i>	Candidate	No effect

Species	Listing Status	Determination
MAMMALS		
Jaguar, <i>Panthera onca</i>	Endangered	May affect
Lesser long-nosed bat, <i>Leptonycteris curasonae</i>	Endangered	May affect
Ocelot, <i>Leopardus pardalis</i>	Endangered	Not likely to adversely affect

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**BIOLOGICAL RESOURCES PLAN
USBP TUCSON SECTOR, NOGALES STATION**

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1. PROJECT DESCRIPTION

The U.S. Department of Homeland Security (DHS), Customs and Border Protection (CBP), U.S. Border Patrol (USBP) plans to construct, operate, and maintain approximately 7.6 miles of tactical infrastructure along the U.S./Mexico international border. Tactical infrastructure will include primary pedestrian fence, vehicle fence, four temporary staging areas, and a new construction/maintenance road. Construction is expected to be completed by December 2008.

On April 1, 2008, the Secretary of DHS, pursuant to his authority under Section 102(c) of the Illegal Immigration Reform and Immigrant Responsibility Act (IIRIRA), exercised his authority to waive certain environmental and other laws in order to ensure expeditious construction of tactical infrastructure along the U.S./Mexico international border. Although the Secretary's waiver means that CBP no longer has any specific legal obligations under these laws, the Secretary committed the Department to responsible environmental stewardship of our valuable natural and cultural resources. CBP strongly supports this objective and remains committed to being a good steward of the environment. To that end, CBP has prepared this Biological Resources Plan (BRP), which analyzes the potential impacts on threatened and endangered species associated with construction of tactical infrastructure in the USBP's Tucson Sector. The BRP also discusses CBP's plans as to how potential impacts on threatened and endangered species can be mitigated. The BRP will help to guide CBP's efforts going forward.

1.1 LOCATION

CBP plans to construct, operate, and maintain tactical infrastructure consisting of primary pedestrian and vehicle fence, construction staging areas, and new maintenance and construction access roads in two discrete sections (Sections D-5B and D-6) in the Tucson Sector in Santa Cruz County, Arizona (see **Figure 1-1**). The Project includes the construction, operation, and maintenance of tactical infrastructure along approximately 7.6 miles of the U.S./Mexico international border in Santa Cruz County, Arizona. The fence will be installed approximately 3 to 6 feet north of the U.S./Mexico international border. Segment D-5B will start approximately 1 mile east of the DeConcini Port of Entry (POE) and extend 5.2 miles eastward. Segment D-6 will extend another 2.4 miles eastward and include both primary pedestrian and vehicle fence. A new access road will be constructed through the U.S. Forest Service (USFS) Coronado National Forest.

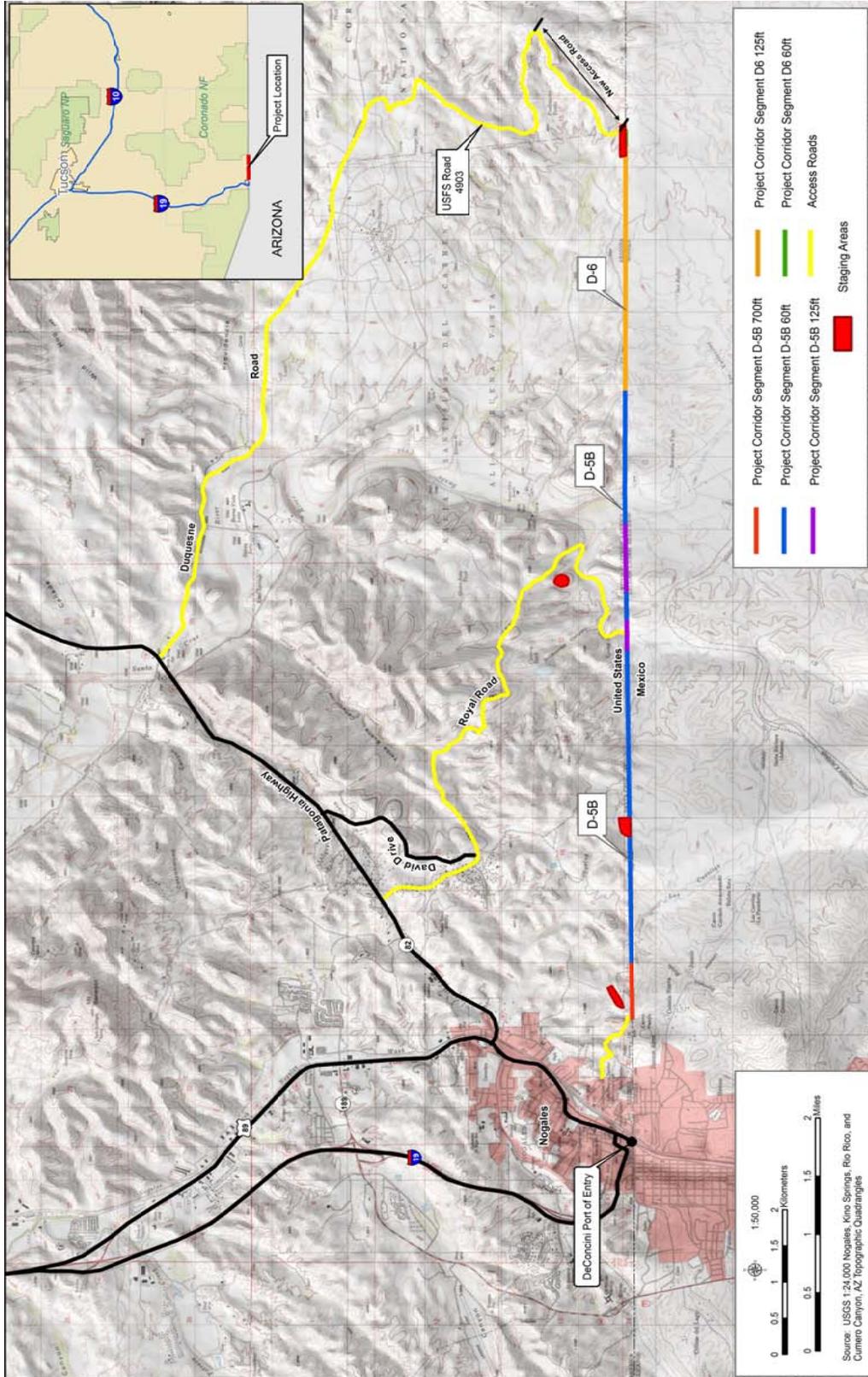


Figure 1-1. Map of Project Area (Sections D-5B and D-6) in Santa Cruz County, Arizona

1.2 CONSTRUCTION, OPERATION, AND MAINTENANCE

The Project consists of the following components: (1) the construction, operation, and maintenance of primary pedestrian and vehicle barrier fence along the U.S./Mexico international border; (2) the construction of a new access road through USFS Coronado National Forest; and (3) the development of four temporary construction staging areas.

A road will be constructed along the border in a manner that will allow installation and maintenance of the fence. Due to steep terrain, the construction footprint will be up to 125 feet wide. This area constitutes the project corridor in which all construction, operation, and maintenance activities will be conducted. Routine maintenance will occur, as needed, to preserve the integrity of the new and existing barrier fence. The barrier fence will be repaired, as needed, using welders and other equipment, and vegetation and debris within the project corridor will be removed, as needed, to maintain visibility and mobility.

Nighttime construction activities will occur only when absolutely necessary for adequate concrete pours or in the case of an accelerated construction schedule to meet Federal mandates. Therefore, to account for heat restrictions for adequate concrete drying and curing processes, most concrete pours for low-water crossings, other drainage structures, and fencing will need to take place during the pre-dawn hours of summer months. However, the possibility exists that work will have to occur on a 24-hour basis to maintain the schedule depending on weather or other unforeseen situations. In order to facilitate construction activities during these work hours, portable lights will be used. It is estimated that no more than 10 lights will be in operation at any one time at each project site. A 6-kilowatt self-contained diesel generator will power these. Each unit typically has four 400- to 1,000-watt lamps. The portable light systems can be towed to the desired construction location, as needed. Upon completion of construction activities, all portable lights will be removed from the Project corridor. Lights will be oriented to illuminate the work area, but the areas affected by illumination will be limited to 200 feet from the light source. Also, because they will not be deployed specifically for providing lighting for enforcement purposes, the lights could have shields placed over the lamps to reduce or eliminate the effects of backlighting.

1.2.1 Fence

Tactical infrastructure includes the construction of approximately 7.6 miles of new primary pedestrian and vehicle barrier fence, with 5.2 miles in Section D-5B and 2.4 miles in Section D-6. Two fence types are planned: Personnel-Vehicle Fence Type 1 (PV-1) and Vehicle Fence Type 2 (VF-2). See **Figures 1-2** and **1-3** for visual representations of the two fence types.



Figure 1-2. Personnel-Vehicle Fence Type-1 (PV-1)



Figure 1-3. Photograph of Vehicle Fence Type-2 (VF-2)

The PV-1 fence is an anchored, 18-foot (aboveground) grout-filled steel bollard-style fence designed to prevent passage by both people and vehicles. Panels of PV-1 fence will be welded together off site and transported to the site by small trucks with lowboy trailers. Using a crane, fence panels will be positioned to be anchored in concrete. Construction of new fence will be completed using equipment such as a trencher or auger, a cement mixer, and a crane. A road will be constructed adjacent to the border to allow installation of the fence. Construction would require a 60-foot- to 125-foot-wide impact corridor (due to steep terrain), starting at the U.S./Mexican international border and extending northward. No pile driving will be required for construction of PV-1 fence.

The VF-2 fence is Normandy-style barrier fence designed to prevent vehicle passage in the floodplain of the Santa Cruz River, while allowing for fence removal during the monsoon season to avoid impeding water flow during high water events. Sections of VF-2 fence will be transported to the site by small trucks with lowboy trailers. The vehicle fence will be put into place using forklifts. A construction/ maintenance road will be constructed in order to install the vehicle fence. No roads or primary pedestrian fence will be constructed across the Santa Cruz River; the existing unimproved low water crossing will be used to cross the river. Construction will require a 60-foot impact corridor. No pile driving will be required for construction of VF-2 fence.

The vehicle fence will be removed by CBP prior to each monsoon season and replaced when flood conditions are no longer imminent. Additionally, in other washes and arroyos, the fence will be designed and constructed as appropriate to ensure proper conveyance of floodwater and to eliminate potential ponding on either side of the fence.

The Project will result in the permanent loss of 116 acres of vegetation, which includes 101 acres of scrub-grassland, 8 acres of madrean evergreen woodlands, 5 acres of riparian deciduous forest and woodland, and less than 2 acres of cottonwood-willow. Scrub-grassland is dominated by herbaceous species, therefore would be the most resistant to disturbance. While not as abundant, due to its affinity for washes, riparian deciduous forest and woodland is common both locally and regionally; thus, degradation or loss of a small portion of this community will be a moderate impact within a local or regional context. Cottonwood-willow is rather unique to major washes and southwestern river systems. This community is important habitat to many riparian wildlife and aquatic species (DHS 2008).

1.2.2 Roads

As stated above, construction/maintenance roads will be constructed adjacent to the north side of the border in both sections. Three existing construction access roads have been also been identified along the Project corridor (see **Figure 1-1**). No improvements to existing access roads are anticipated. These roads are maintained through use agreements between USBP and landowners. One new

access road will be constructed in Section D-6, through the USFS Coronado National Forest, to connect USFS Road 4903 to the border. The new road will be 20 to 30 feet wide (including parallel ditches and shoulders) and 1.34 miles long.

1.2.3 Staging Areas

The Project includes the establishment of four temporary staging areas. Storage of equipment and materials at the temporary staging areas will result in the temporary disturbance of 26 acres of the common scrub-grassland community. Upon completion of construction activities, natural vegetation will be allowed to regenerate from the existing seed bank, undamaged root stocks of shrubs, and stem segments of cacti, or undergo active rehabilitation if deemed necessary.

1.2.4 Fence Maintenance Operations

There will be no change in overall USBP Sector operations resulting from the Project. The pedestrian and vehicle fences will be made from nonreflective steel and will not require any painting. Fence maintenance will include removing any accumulated debris on the fence after a rain event to avoid potential future flooding. Sand that builds up against the fence and brush will also be removed, as needed. Brush removal could include mowing, removal of small trees, and application of herbicide, if needed. The Normandy-style vehicle fence will be installed within the floodplain of the Santa Cruz River, so that it could be removed prior to each monsoon season and replaced shortly after floodflows subside. During normal patrols, sector personnel will observe the condition of the fence. Any destruction or breaches of the fence will be repaired, as needed.

1.3 BEST MANAGEMENT PRACTICES

1.3.1 General Best Management Practices

The following best management practices (BMPs) should be implemented to avoid or minimize impacts associated with the Project during construction. These represent project objectives for implementation to the extent possible and will be incorporated into construction and monitoring contracts.

1. The perimeter of all areas to be disturbed during construction or maintenance activities in Sections D-5B and D-6 will be clearly demarcated using flagging or temporary construction fence, and no disturbance outside that perimeter will be authorized.
2. CBP will develop (in coordination with U.S. Fish & Wildlife Service [USFWS]) a training plan regarding Trust Resources for construction personnel. At a minimum, the program will include the occurrence of the listed and sensitive species in the area, their general ecology, sensitivity of the species to human activities, protection afforded these species, and project features designed to reduce the impacts to these species and

promote continued successful occupation of the project area environments by the species.

Included in this program will be color photos of the listed species, which will be shown to the employees. Following the education program, the photos will be posted in the office of the contractor and resident engineer, where they will remain through the duration of the project. The selected construction contractor will be responsible for ensuring that employees are aware of the listed species.

3. **Project Reports.** For construction and maintenance projects (e.g., fences, towers, stations, facilities) within 3 months of project completion, a Project Report will be developed that details the BMPs that were implemented, identifies how well the BMPs worked, discusses ways that BMPs could be improved for either protection of species and habitats or implementation efficiency, and reports on any federally listed species observed at or near the project site. If site restoration was included as part of the project, the implementation of that restoration and any follow-up monitoring will be included. Annual reports could be required for some longer-term projects. The project and any annual reports will be made available to the USFWS.
4. **Biological Surveys for each Project.** CBP will either assume presence of a federally listed species based on suitable habitat or known presence, and implement appropriate measures or will, as part of project design and planning, perform reconnaissance-level preconstruction surveys to validate presence of suitable habitat.
5. **Relocation of individuals of federally listed plants found in the project area is generally not a suitable activity.** Relocation of aquatic species such as the water umbel and ladies'-tresses is not appropriate. Relocation of small cacti has not been very successful, and is not recommended. A salvage plan will be developed and approved by the government prior to the action. The CBP biological monitor will identify a location for storing any salvaged cactus and/or agaves. For particular actions, the USFWS will advise CBP regarding the relocation of plants.
6. **Individual federally listed animals found in the project area will be relocated by a qualified biologist to a nearby safe location in accordance with accepted species-handling protocols to the extent practicable.**
7. **All construction projects in habitats of federally listed species will have a qualified designated biological monitor on site during the work.** The biological monitor will document implementation of construction-related BMPs designed for the project to reduce the potential for adverse effects on the species or their habitats. Weekly reports from the biological monitor should be used for developing the Project Report.
8. **Where, based on species location maps or results of surveys, individuals of a federally listed species could be present on or near the project site, a designated biological monitor will be present during construction activities**

to protect individuals of the species from harm. Duties of the biological monitor will include ensuring that activities stay within designated project areas, evaluating the response of individuals that come near the project site, and implementing the appropriate BMP. The designated biological monitor will notify the construction manager of any activities that might harm or harass an individual of a federally listed species. Upon such notification, the construction manager may temporarily suspend all activities in question and notify the Contracting Officer, the Administrative Contracting Officer, and the Contracting Officer's Representative of the suspense so that the key U.S. Army Corps of Engineers (USACE) personnel can be notified and apprised of the situation and the potential situation can be resolved.

9. Where a construction project could be located within 1 mile of occupied species habitats but the individuals of the species are not likely to move into the project area, a biological monitor is not needed. However, the construction monitor will be aware of the species-specific BMPs and ensure that BMPs designed to minimize habitat impacts are implemented and maintained as planned. This category includes the lesser long-nosed bat and all aquatic species.
10. Particular importance is given to proper design and location of roads so that the potential for road bed erosion into federally listed species habitat will be avoided or minimized.
11. Particular importance is given to proper design and location of roads so that the potential for entrapment of surface flows within the roadbed due to grading will be avoided or minimized. Depth of any pits created will be minimized so animals do not become trapped.
12. Particular importance is given to proper design and location of roads so that the widening of existing or created roadbed beyond the design parameters due to improper maintenance and use will be avoided or minimized.
13. Particular importance is given to proper design and location of roads so that excessive use of unimproved roads for construction purposes that results in their deterioration that affects the surrounding federally listed species habitat areas will be minimized. Road construction and use for construction will be monitored and documented in the Project Report.
14. Particular importance is given to proper design and location of roads so that the fewest roads needed for construction will be developed and that these are maintained to proper standards. Roads no longer needed by the government should be closed and restored to natural surface and topography using appropriate techniques. The Global Positioning System (GPS) coordinates of roads that are thus closed should be recorded and integrated into the USBP Geographic Information System (GIS) database. A record of acreage or miles of roads taken out of use, restored, and revegetated will be maintained.

15. The width of all roads that are created or maintained by CBP for construction purposes will be measured and recorded using GPS coordinates and integrated into the USBP GIS database. Maintenance actions should not increase the width of the road bed or the amount of disturbed area beyond the roadbed.
16. Construction equipment will be cleaned using BMPs prior to entering and departing the project corridor to minimize the spread and establishment of non-native invasive plant species.
17. Surface water from untreated sources, including water used for irrigation purposes, will not be used for construction or maintenance projects located within 1 mile of aquatic habitat for federally listed aquatic species. Groundwater or surface water from a treated municipal source will be used when close to such habitats. This is to prevent the transfer of invasive animals or disease pathogens between habitats if water on the construction site was to reach the federally listed species habitats.
18. Materials such as gravel or topsoil will be obtained from existing developed or previously used sources, not from undisturbed areas adjacent to the project area.
19. If new access is needed or existing access requires improvements to be usable for the Project, related road construction and maintenance BMPs will be incorporated into the access design and implementation.
20. When available, areas already disturbed by past activities or those that will be used later in the construction period will be used for staging, parking, and equipment storage, where practicable.
21. Within the designated disturbance area, grading or topsoil removal will be limited to areas where this activity is needed to provide the ground conditions needed for construction or maintenance activities. Minimizing disturbance to soils will enhance the ability to restore the disturbed area after the project is complete.
22. Removal of trees and brush in habitats of federally listed species will be limited to the smallest amount needed to meet the objectives of the project. This type of clearing is likely to be a permanent impact on habitat.
23. Water for construction use will be from wells or irrigation water sources at the discretion of the landowner (depending on water rights). If local groundwater pumping creates an adverse effect on aquatic-, marsh-, or riparian-dwelling federally listed species, treated water from outside the immediate area will be utilized.
24. Surface water from aquatic or marsh habitats will not be used for construction purposes if that site supports aquatic federally listed species or if it contains nonnative invasive species or disease vectors and there is any opportunity to contaminate a federally listed species habitat through use of the water at the project site.

25. Water tankers that convey untreated surface water will not discard unused water where it has the potential to enter any aquatic or marsh habitat.
26. Water storage on the project area should be in closed on-ground containers located on upland areas, not in washes.
27. Pumps, hoses, tanks, and other water storage devices will be cleaned and disinfected with a 10 percent bleach solution at an appropriate facility before use at another site. If untreated surface water was used (this water is not to enter any surface water area). If a new water source is used that is not from a treated or groundwater source, the equipment will require additional cleaning. This is important to kill any residual disease organisms or early life stages of invasive species that could affect local populations of federally listed species.
28. CBP will develop and implement storm water management plans for every project.
29. All construction will follow DHS management directive 5100 for waste management.
30. A CBP-approved spill protection plan will be developed and implemented at construction and maintenance sites to ensure that any toxic substances are properly handled and that escape into the environment is prevented. Agency standard protocols will be used. Drip pans underneath equipment, containment zones used when refueling vehicles or equipment, and other measures are to be included.
31. Nonhazardous waste materials and other discarded materials, such as construction waste, will be contained until removed from the construction site. This will assist in keeping the project area and surroundings free of litter and reduce the amount of disturbed area needed for waste storage.
32. To eliminate attracting predators of protected animals, all food-related trash items such as wrappers, cans, bottles, and food scraps will be disposed of in closed containers and removed daily from the project site.
33. Waste water is water used for project purposes that is contaminated with construction materials, or was used for cleaning equipment and thus carries oils or other toxic materials or other contaminants in accordance with state regulations. Waste water will be stored in closed containers on site until removed for disposal. Concrete wash water will not be dumped on the ground, but is to be collected and moved offsite for disposal. This wash water is toxic to aquatic life.
34. If an individual of a federally listed species is found in the designated project area, work will cease in the area of the species until either a qualified biological monitor can safely remove the individual, or it moves away on its own, to the extent practicable, construction schedule permitting.

35. Construction speed limits will not exceed 35 miles per hour (mph) on major unpaved roads (graded with ditches on both sides) and 25 mph on all other unpaved roads. Nighttime travel speeds will not exceed 25 mph, and might be less based on visibility and other safety considerations. Construction at night will be minimized.
36. No pets owned or under the care of the construction contractor or any and all construction workers will be permitted inside the project's construction boundaries, adjacent native habitats, or other associated work areas. This BMP does not apply to any animals under service to the USBP (such as canine and horse patrols).
37. If construction or maintenance activities continue at night, all lights will be shielded to direct light only onto the area required for worker safety and productivity. The minimum wattage needed will be used and the number of lights will be minimized.
38. Light poles and other pole-like structures will be designed to discourage roosting by birds, particularly ravens or raptors that may use the poles for hunting perches.
39. Noise levels for day or night construction and maintenance will be minimized. All generators will be in baffle boxes (a sound-resistant box that is placed over or around a generator), have an attached muffler, or use other noise-abatement methods in accordance with industry standards.
40. Transmission of disease vectors and invasive nonnative aquatic species can occur if vehicles cross infected or infested streams or other waters and water or mud remains on the vehicle. If these vehicles subsequently cross or enter uninfected or noninfested waters, the disease or invasive species could be introduced to the new area. To prevent this, crossing of streams or marsh areas with flowing or standing water will be avoided by construction vehicles and equipment, and, if not avoidable, the construction vehicle/equipment will be sprayed with a 10 percent bleach solution.
41. Materials used for onsite erosion control in uninfested native habitats will be free of nonnative plant seeds and other plant parts to limit potential for infestation. Since natural materials cannot be certified as completely weed-free, if such materials are used, there will be follow-up monitoring to document establishment of nonnative plants, and appropriate control measures will be implemented for a period of time to be determined in the site restoration plan.
42. Fill material brought in from outside the project area will be identified as to source location and will be weed-free to the extent practicable.
43. For purpose of construction, infrastructure sites will only be accessed using designated roads. Parking will be in designated areas. This will limit the development of multiple trails to such sites and reduce the effects to federally listed habitats in the vicinity.

44. Appropriate techniques to restore the original grade, replace soils, and restore proper drainage will be implemented for areas to be restored (e.g., temporary staging areas).
45. A site restoration plan for federally listed species and habitat will be developed during project planning and provide an achievement goal to be met by the restoration activity. If seeding with native plants is identified as appropriate, seeding will take place at the proper season and with seeds from nearby stocks, to the extent practicable. It is understood that some sites cannot be restored, and the project planning documents should acknowledge this.
46. During follow-up monitoring and during maintenance activities, invasive plants that appear on the site will be removed. Mechanical removal will be done in ways that eliminate the entire plant and remove all plant parts to a disposal area. All chemical applications on refuges must be used in coordination with the NPS Integrated Pest Management Coordinator to ensure accurate reporting. Herbicides can be used according to label directions. The monitoring period will be defined in the site restoration plan. Training to identify non-native invasives will be provided for CBP contractor personnel, as necessary.
47. Maintenance activities in cactus and agave habitat will not increase the existing disturbed areas. Use of existing roads and trails will be maximized in areas of suitable habitat for cactus and agaves. Protection of the cactus will be stressed in environmental education for contractors involved in construction or maintenance of facilities.
48. To prevent entrapment of wildlife species during emplacement of vertical posts/bollards, all vertical fence posts/bollards that are hollow (i.e., those that will be filled with a reinforcing material such as concrete), will be covered so as to prevent wildlife from entrapment. Covers will be deployed from the time the posts or hollow bollards are erected to the time they are filled with reinforcing material.
49. To prevent entrapment of wildlife species during the construction of the project, all excavated, steep-walled holes or trenches will either be covered at the close of each working day by plywood or provided with one or more escape ramps constructed of earth fill or wooden planks. The ramps will be located at no greater than 1,000-foot intervals and will be sloped less than 45 degrees. Each morning before the start of construction and before such holes or trenches are filled, they will be thoroughly inspected for trapped animals. Any animals so discovered will be allowed to escape voluntarily (by escape ramps or temporary structures), without harassment, before construction activities resume, or removed from the trench or hole by the biological monitor and allowed to escape unimpeded.

1.3.2 BMPs for Temporary Impacts

The following apply as offsetting conservation measures for temporary impacts.

1. Site restoration of temporarily disturbed areas such as staging areas and construction access routes will be monitored as appropriate.
2. During follow-up monitoring of any restoration areas, invasive plants that appear on the site will be removed. Mechanical removal will be done in ways that eliminate the entire plant and remove all plant parts to a disposal area. All chemical applications on refuges must be used in coordination with the NPS Integrated Pest Management Coordinator to ensure accurate reporting. Herbicides can be used according to label directions. The monitoring period will be defined in the site restoration plan. Training to identify nonnative invasive plants will be provided for CBP contractor personnel, as necessary.

1.3.3 Species-Specific BMPs

Pima Pineapple Cactus

1. Maintenance activities in Pima pineapple cactus habitat should not increase the existing disturbed areas, subsequent to the construction of the project.
2. Use of existing roads and trails should be maximized in areas of suitable habitat for the Pima pineapple cactus. Maps of suitable habitat areas should be available and protection of the Pima pineapple cactus stressed in environmental education for CBP personnel and contractors involved in construction or maintenance of facilities.
3. Salvage of individual Pima pineapple cacti, if any undiscovered specimens are found, will be considered only when on-site or off-site habitat conservation is not possible and death of the individual is unavoidable.

Huachuca Water Umbel

1. Because loss of habitat is a significant risk to the water umbel, no roads, fences, structures, or other on-ground facilities will be placed within 0.5 miles of occupied or potentially suitable habitat areas. If these areas cannot be avoided, minimization and mitigation will be included in the project design.
2. If facilities must be located within 0.5 miles of known or potential habitat, vegetation clearing will be limited, and erosion-control measures put in place to reduce sediment runoff potential. Monitoring of effects on aquatic habitat during construction could be required.

3. Preconstruction surveys are not required as long as projects are located at least 0.5 miles from occupied habitat areas so that watershed effects will not reach the water-umbel habitat.
4. Whenever practicable, road construction and maintenance will not improve or create new available access to water-umbel habitats.
5. Use of existing roads and trails in or adjacent to water-umbel habitat will be maximized. Educational briefing materials on the presence of the species will be provided as part of training. Maps can be helpful for this purpose.

Gila Topminnow

1. Preconstruction surveys are not required since all topminnow populations are documented. Locations of populations will be obtained during early planning.
2. In planning for roads and fences that would require land clearing in the watershed of habitat, the minimum amount of vegetation will be cleared, and measures to control erosion off the construction site will be put into place. Roads and fences that would require land clearing will be designed to avoid areas within 0.5 miles of sites containing habitat to the extent practicable.
3. If facilities must be located within 0.5 miles of sites, vegetation clearing will be limited, and erosion-control measures put in place concurrent to construction to reduce sediment runoff potential. Monitoring of effects on aquatic habitat during construction could be required.
4. Removal of riparian vegetation within 100 feet of streams will be avoided to the extent practicable to provide a buffer area to protect stream banks.

Chiricahua Leopard Frog

1. Roads will be designed to minimize animal collisions and fragmentation of federally listed populations. Exclusion fencing might be appropriate where road kill is likely or to direct species to underpasses or other passageways. Specific protocols are available for Chiricahua leopard frog.
2. Monitoring of effects on the frog's terrestrial and aquatic habitat during construction could be required. Disease prevention protocols will be employed if the project is in areas known or likely to harbor chytridiomycosis (consult with the USFWS to identify these areas). In such cases, if vehicles/equipment use will occur in more than one frog habitat, ensure that all equipment is clean and dry or disinfected before it moves to another habitat.

3. To the extent practicable, removal of riparian vegetation within 100 feet of aquatic habitats will be avoided to provide a buffer area to protect the habitat from sedimentation.

Jaguar and Ocelot

1. If construction or maintenance activities continue at night, all lights will be shielded to direct light only onto the work site and the area necessary to ensure the safety of the workers.
2. Roads will be designed to minimize animal collisions and fragmentation of T&E populations to the extent practicable.

Lesser Long-Nosed Bat

1. When planning activities, avoid, to the extent practicable, areas containing columnar cacti (e.g., saguaro and organ pipe) or agaves that provide the forage base for the bat.
2. Maintenance activities for facilities can occur at any time; however, for major work on roads or fences where significant amounts of equipment will be required, the October to April period is the preferred period for such activities
3. If construction or maintenance activities continue at night, all lights will be shielded to direct light only onto the work site and the area necessary to ensure the safety of the workers.

1.3.4 Compensation Measures

It is CBP's policy to reduce impacts through the sequence of avoidance, minimization, and mitigation. Current estimates of impacts for jaguar and lesser-long nosed bat habitat are presented in **Table 1-1**. CBP will mitigate for these impacts as appropriate. Additionally, the Project may affect, but is not likely to adversely affect Pima pineapple cactus, Huachuca water umbel, gila topminnow, and Chiricahua leopard frog. If the Project results in adverse impacts on these species, CBP will mitigate as appropriate. Actual impacts to habitats will be documented during construction by the environmental monitors and included in the Project Report which will be made available to USFWS.

Using funds contributed to the compensation pool by CBP, USFWS may offset permanent direct and indirect impacts on habitat used by Federal listed species. USFWS may use these monies to fund conservation actions benefitting these species.

Jaguar

1. Using funds from the mitigation pool established by CBP, USFWS may support Jaguar Conservation Team activities or support the monitoring program, such as funding for additional trip cameras at potential jaguar locations and radio telemetry.

Table 1-1. Summary of Permanent Impacts of the Project on Habitat

Habitat Type	Estimated Acres of Permanent Impact
Scrub-Grassland (habitat for jaguar and lesser long-nosed bat)	101
Madrean Evergreen Woodlands (habitat for jaguar)	8
Cottonwood Willow (habitat for jaguar)	2
Riparian Deciduous Forest and Woodland, Mixed Broadleaf Series (habitat for jaguar)	5
Totals	116

Lesser Long-Nosed Bat

1. Using funds from the mitigation pool established by CBP, USFWS may continue monitoring of maternity and summer roost sites to assist in documenting the status of the species. Infra-red cameras could also be purchased to document bats at roosts.
2. Using funds from the mitigation pool established by CBP, USFWS may support telemetry monitoring of foraging bats to determine the degree to which roads, fences, and other operations facilities act as barriers or increase habitat fragmentation to provide useful information for determining the effect on bat foraging and movement of future projects.

2. DESCRIPTION OF SPECIES AND THEIR HABITAT

This section summarizes information regarding some of the key species and habitats addressed in this document. Some listed species are not included here because the implementation of the agreed upon BMPs and conservation measures are anticipated to provide conditions that avoid adverse effect. For more complete information and supporting citations regarding species' descriptions, distribution and abundance, habitat needs, life history, and population ecology, the local USFWS office can be contacted.

2.1 HUACHUCA WATER UMBEL

The Huachuca water umbel (*Lilaeopsis schaffneriana* ssp. *recurva*) was listed as Endangered on January 6, 1997 (62 Federal Register [FR] 3) with critical habitat (64 FR 37441, July 12, 1999).

Land management/ownership for this species includes areas associated with the Coronado National Forest, San Bernardino National Wildlife Refuge, Bureau of Land Management, Fort Huachuca Military Reservation, and private land holdings (USFWS 2001a).

Critical habitat includes 83.2 kilometers (km) (51.7 miles) of streams or rivers in Cochise and Santa Cruz counties, Arizona. The following general areas are included in the critical habitat: Sonoita Creek, Santa Cruz River, Scotia Canyon, Sunnyside Canyon, Garden Canyon, Lone Mountain Canyon, Rattlesnake Canyon, Bear Canyon, and 54.2 km (33.7 miles) of the Upper San Pedro River (USFWS 2001a).

2.1.1 Species Description

The species is a slender, erect terrestrial perennial orchid found on slopes adjacent to marshy wetlands or cienegas intermixed with tall grasses and sedges. The water umbel is an herbaceous semi-aquatic perennial in the parsley family (Umbelliferae) with slender erect leaves that grow from the nodes of creeping rhizomes. The leaves are segmented, hollow cylinders, and are 1–3 millimeters (mm) (0.04–0.12 inches) in diameter, but their length can vary from 2.5–22.9 centimeters (cm) (1–9 inches), depending on the depth of the water. Tiny 3- to 10-flowered umbels arise from root nodes. The inflorescence is 1.25–5.0 cm (0.5–2.0 inches) long and is always shorter than the stems (USFWS 2001a).

2.1.2 Distribution and Abundance

The current range includes a number of disjunct localities in Santa Cruz, Cochise, and Pima counties, Arizona; and Sonora, Mexico. Potential range for the species could be wherever habitat conditions are met in southeastern Arizona or northern Mexico (USFWS 2001a).

2.1.3 Habitat

Typical habitat includes cienegas and associated vegetation within Sonoran desertscrub, grassland or oak woodland, and conifer forest between 1,210–1,970 meters (4,000–6,500 feet). *L. schaffneriana* ssp. *recurva* seems to require an intermediate level of flooding frequency to keep competition manageable, but populations can be destroyed when floods are too frequent and intense. Plants are found in unshaded or shaded sites. They require perennial water, gentle stream gradients, small- to medium-sized drainage areas, and (apparently) mild winters. Usually found in water depth from 5–25 cm (2–10 inches) (USFWS 2001a).

2.1.4 Threats

Wetland habitats for the species are rare and declining in the Southwest. Threats include watershed degradation due to livestock grazing and development, trampling by livestock, diversion of water and dewatering of habitats, and flash flooding (USFWS 2001a).

2.2 PIMA PINEAPPLE CACTUS

The pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*) was listed as Endangered on September 23, 1993 (58 FR 49875) without critical habitat.

Land management/ownership for this species includes areas associated with Bureau of Land Management, Coronado National Forest, Buenos Aires National Wildlife Refuge, State Land Department, possibly Bureau of Reclamation, and the Tohono O’Odham and Pascua Yaqui Tribes (USFWS 2000a).

Protected from international trade, Pima pineapple cactus is covered by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The species is also known as Scheer’s strong-spined cory cactus. *Mammillaria robustispina* is a synonym for *Coryphantha scheeri* var. *robustispina*. This species can be confused with juvenile barrel cactus (*Ferocactus*) (USFWS 2000a).

2.2.1 Species Description

The Pima pineapple cactus is a low-growing cactus species that can be found as single- or multi-stemmed plants. The species grows in the transition zone between the semi-desert grasslands and Sonoran desertscrub on alluvial bajadas and slopes of less than 10 percent at elevations between 2,300–4,600 feet (USFWS 2000a).

The Pima pineapple cactus is an attractive hemispherical plant; the adults measure 10–46 cm (4–18 inches) tall and 7.5–18 cm (3–7 inches) in diameter. The spines appear in clusters with one strong, usually hooked central spine and 6–15 straight radial spines. The spines are very stout, usually straw-colored, but

become black with age. The plants can be single-stemmed, multiheaded, or can appear in clusters. The flowers are silky yellow (rarely white) in color and appear in early July with the summer rains. Flowering continues until August. The fruit is green, ellipsoid, succulent, and sweet (USFWS 2000a).

2.2.2 Distribution and Abundance

Currently, Pima pineapple cactus is found at elevations from 700–1,400 meters (2,300–4,500 feet) in Pima and Santa Cruz counties, Arizona; and northern Sonora, Mexico. The range extends east from the Baboquivari Mountains to the western foothills of the Santa Rita Mountains. The northernmost boundary is near Tucson. Potential habitat for this species is difficult to estimate due to its habitat requirements and the topographic complexity within its range (USFWS 2000a).

2.2.3 Habitat

This cactus grows in alluvial basins or on hillsides in semi-desert grassland and Sonoran desertscrub in southern Arizona and northern Mexico. Soils range from shallow to deep, and silty to rocky, with a preference for silty to gravely deep alluvial soils. The plant occurs most commonly in open areas on flat ridge tops or areas with less than 10–15 percent slope (USFWS 2000a).

2.2.4 Threats

Threats to this species include illegal collection; habitat degradation due to recreation and historical and present overuse of the habitat by livestock; habitat loss due to mining, agriculture, road construction, urbanization, aggressive non-native grasses, and range management practices to increase livestock forage (USFWS 2000a).

2.3 GILA TOPMINNOW

The Gila topminnow (*Poeciliopsis occidentalis occidentalis*) was listed as Endangered on March 11, 1967 (32 FR 4001) without critical habitat.

Land management/ownership for this species includes areas associated with USFS, Bureau of Land Management, the States of Arizona and New Mexico, Tribal lands, and private land holdings (USFWS 2008a).

The species is currently being reared at more than 100 locations for reestablishment into numerous sites in Arizona. The Gila topminnow has been released at almost 200 locations in efforts to reestablish populations (USFWS 2008a).

2.3.1 Species Description

The Gila topminnow is native to the Gila River basin in Arizona and New Mexico. This small minnow was abundant in spring pools, cienegas, marshes, and small streams in the Sonoran desert. The species is a small (2.5–5 cm [1–2 inches] long), guppy-like, live-bearing fish (which lacks dark spots on its fins). Breeding males are jet black with yellow fins (USFWS 2008a).

2.3.2 Distribution and Abundance

The species was historically one of the most common fish found throughout the Gila River drainage in Arizona, whose range also extended into Mexico and New Mexico (USFWS 2008a).

The species currently occurs in Mexico and Arizona. In Arizona, most of the remaining native populations are in the Santa Cruz River system. Species occurs in small streams, springs, and cienegas in Gila, Pinal, Graham, Yavapai, Santa Cruz, Pima, Maricopa, and La Paz counties (USFWS 2008a).

2.3.3 Habitat

The species occurs in small streams, springs, and cienegas below an elevation of 1,350 meters (4,500 feet), primarily in shallow areas with aquatic vegetation and debris for cover. Gila topminnow can tolerate relatively high water temperatures and low dissolved oxygen (USFWS 2008a).

2.3.4 Threats

Impacts include the introduction and spread of nonindigenous predatory and competitive fish, water impoundment and diversion, water pollution, groundwater pumping, stream channelization, and habitat modification (USFWS 2008a).

2.4 CHIRICAHUA LEOPARD FROG

The Chiricahua leopard frog (*Lithobates [Rana] chiricahuensis*) was listed as Threatened on June 13, 2002 (67 FR 40790) without critical habitat.

At listing, a special rule was finalized that exempts from the Section 9 take prohibitions of the Endangered Species Act (ESA) incidental take of frogs due to operation and maintenance of livestock tanks on non-Federal lands. A recovery plan was completed in April 2007. Safe Harbor agreements are in place throughout the range of the species in Arizona and southwestern New Mexico (USFWS 2008b).

Land management/ownership for this species includes areas associated with the San Bernardino and Buenos Aires National Wildlife Refuges; Coconino, Coronado, Gila, Tonto, Apache-Sitgreaves National Forests; Bureau of Land Management; and private land holdings (USFWS 2008b).

2.4.1 Species Description

The leopard frog has a distinctive pattern on the rear of the thigh consisting of small, raised, cream-colored spots or tubercles on a dark background; dorsolateral folds that are interrupted and deflected medially; stocky body proportions; relatively rough skin on the back and sides; and often green coloration on the head and back. The species also has a distinctive call consisting of a relatively long snore of 1 to 2 seconds in duration. Snout-vent lengths of adults range from approximately 54 to 120 mm (2.1 to 4.7 inches) (USFWS 2008b).

Leopard frogs from the eastern slope of the Huachuca Mountains in Cochise County, Arizona, were described as the Ramsey Canyon leopard frog (*Rana subaquavocalis*), but consensus in the herpetological community is that it is actually a population of the Chiricahua leopard frog. However, until such time that the listing is revised; the Ramsey Canyon leopard frog is not considered listed under the ESA. Populations of the Chiricahua leopard frog in central and east-central Arizona and west-central New Mexico (Mogollon Rim form) are disjunct from those in southeastern Arizona, southwestern New Mexico, and Mexico, and might represent a distinct species (USFWS 2008b).

2.4.2 Distribution and Abundance

A total of 298 and 182 historical localities are known for the species in Arizona and New Mexico, respectively. An additional 34 localities are known from Sonora and Chihuahua, Mexico (USFWS 2008b).

The species' current range is similar to its historical range, but the frog is not well-represented in many areas now, and has apparently disappeared from some drainages and mountain ranges. At the time of listing (2002) the frog was likely extant at an estimated 87 and 31–41 localities in Arizona and New Mexico, respectively. The most recent reports, from February 2008, estimate the frog is extant at 49 and 30–35 localities in Arizona and New Mexico, respectively; which represents extirpation from 82–84 percent of historical U.S. localities. The status of the 34 collection localities in Mexico is not well known (USFWS 2008b).

2.4.3 Habitat

The Chiricahua leopard frog was historically an inhabitant of cienegas, pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 1,000 to 2,710 meters (3,281 to 8,890 feet) in central, east-central, and southeastern Arizona (i.e., Santa Cruz, Apache, Gila, Pima, Cochise, Greenlee, Graham, Yavapai, Coconino, and Navajo counties); west-central and southwestern New Mexico; and in Mexico, northeastern Sonora, and the Sierra Madre Occidental of northwestern Chihuahua. The Chiricahua leopard frog is now often restricted to springs, livestock tanks, and streams in the upper portions of watersheds where nonnative predators either have yet to invade or habitats are marginal.

Distribution and habitat use of the Chiricahua leopard frog in Mexico are not well known (USFWS 2008b).

2.4.4 Threats

The most serious threats to this species include predation by nonnative organisms, especially bullfrogs, fishes, and crayfish; and an apparently introduced fungal skin disease (chytridomycosis or “Bd”) that is killing frogs and toads around the globe. Other threats include drought, floods, wildfires, degradation and destruction of habitat, water diversions and groundwater pumping, disruption of metapopulation dynamics (relationships among populations of frogs), increased chance of extirpation or extinction resulting from small numbers of populations and individuals, and environmental contamination (USFWS 2008b).

2.5 JAGUAR

The U.S. population of jaguar (*Panthera onca*) was listed as Endangered on July 22, 1997 (62 FR 39147) without critical habitat. Non-U.S. population was listed as Endangered on March 30, 1972 (37 FR 6476).

Land management/ownership for this species includes areas associated with National Park Service, USFS, Bureau of Land Management, various Native American nations, the State of Arizona, and private land holdings (USFWS 2000b).

The species is protected from international trade by the CITES.

2.5.1 Species Description

The species is a large, heavy-bodied, big-headed cat. Yellowish to tawny, spotted with black rosettes or rings in horizontal rows along the back and sides; most rings are tan inside, with one or two black spots. Legs, head, and tail have smaller, solid spots, usually giving way to incomplete bands near the end of the tail (USFWS 2000b).

The jaguar is the largest species of cat native to the Western Hemisphere. The species is muscular, with relatively short, massive limbs, a deep-chested body, cinnamon-buff in color with many black spots. Weight ranges widely from 40–135 kilograms (90–300 pounds). Length is 2.4 meters (7.8 feet) from head to tail tip (USFWS 2000b).

2.5.2 Distribution and Abundance

The historic range included California, Arizona, New Mexico, Louisiana, south through Texas and into central South America. In Arizona the species was found in mountainous parts of eastern Arizona to the Grand Canyon (USFWS 2000b).

The current range includes central Mexico and into central South America as far south as northern Argentina. There are no known breeding populations in the United States (USFWS 2000b).

In Arizona, the general distribution of past sightings and the habitats associated with these sightings include areas of forest, woodland, and grassland vegetation types in the Baboquivari Mountains, the southern portion of the Altar Valley, a portion of the southern Santa Cruz River basin, and the San Pedro River basin south of Arivapa Creek. Recent (2001–2007) jaguar observations in south-central Arizona near the Mexican border have primarily occurred in Madrean oak woodland communities; however, jaguars were also documented in open mesquite grasslands and desert scrub/grasslands on the desert valley floor (USFWS 2007b).

2.5.3 Habitat

The species is found near water in the warm tropical climate of savannah and forest. Rarely found in extensive arid areas. Individuals in Arizona have been found in Sonoran desertscrub up through subalpine conifer forest (USFWS 2000b). Most jaguar detections occurred in Madrean oak woodland communities; however, jaguars were also documented in open mesquite grasslands and desert scrub/grasslands on the desert valley floor.

2.5.4 Threats

A number of threats contributed to or continue to affect the status of northern jaguar populations, including illegal shooting; overhunting of jaguar prey species; and habitat loss, fragmentation, and modification (USFWS 2000b). Changes in jaguar habitat have affected not only habitat for breeding and foraging, but also movement corridors.

2.6 LESSER LONG-NOSED BAT

The lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*) was listed as Endangered on September 30, 1988 (53 FR 38456) without critical habitat.

Land management/ownership for this species includes lands owned by or managed by U.S. Fish and Wildlife Service (USFWS), Bureau of Land Management, National Park Service, USFS, Department of Defense, several Tribes, the State of Arizona, and private land holdings (USFWS 2001b).

2.6.1 Species Description

The lesser long-nosed bat is a yellow-brown or cinnamon gray bat, with a total head and body measurement of approximately 7.62 cm (3 inches). The tongue measures approximately the same length as the body. This species also has a small noseleaf. The wingspan of *L. curasoae* is approximately 25 cm (10 inches) and the mass is roughly 23 grams. Previously known as Sanborn's long-nosed

bat (*Leptonycteris sanborni*), the species is a medium-sized bat slightly smaller than the Mexican long-nosed bat (USFWS 2001b).

2.6.2 Distribution and Abundance

The species historically ranged from central Arizona and southwestern New Mexico through much of Mexico to El Salvador. Records exist for occurrences in the southern Peloncillo Mountains of New Mexico (USFWS 2001b).

The current range is similar to historic; however, the number of occupied roost sites and the number of individuals per colony have recently declined drastically. These bats are seasonal (April to September) residents of southeastern Arizona, and possibly extreme western Arizona (i.e., Cochise, Pima, Santa Cruz, Graham, Pinal and Maricopa counties, Arizona) (USFWS 2001b).

2.6.3 Habitat

Habitat for the species includes mainly desert scrub habitat in the U.S. portion of its range. In Mexico, the species occurs up into high elevation pine-oak and ponderosa pine forests. Altitudinal range is from 480–3,450 meters (1,600–11,500 feet). Roosting is in caves, abandoned mines, and unoccupied buildings at the base of mountains where agave, saguaro, and organ pipe cacti are present. The species forages at night on nectar, pollen, and fruit of paniculate agaves and columnar cacti (USFWS 2001b).

2.6.4 Threats

Considerable evidence exists for the interdependence of *Leptonycteris* bat species and certain agaves and cacti. Excess harvest of agaves in Mexico; the collection of cacti in the United States; and the conversion of habitat for agricultural uses, livestock grazing, wood-cutting, and other development might contribute to the decline of long-nosed bat populations. These bats are particularly vulnerable due to many individuals using only a small number of communal roosts (USFWS 2001b).

2.7 OCELOT

The ocelot (*Leopardus pardalis*) was listed as endangered on March 28, 1972.

2.7.1 Species Description

Ground colors of the short fur of the ocelot, varies from creamy, or tawny yellow, to reddish grey and grey. The underside of the body, tail, and insides of the limbs is whitish. Rather more blotched than spotted, the chain-like spots are bordered with black. Ocelots have both solid and open dark spots which sometimes run in lines along the body. The back of the ears is black with a central yellowy/white band. Solid black spots mark the head and limbs. There

are two black stripes on the cheeks and one or two transverse bars on the insides of the forelegs. The tail is either ringed or marked with dark bars on its upper surface. The eye sockets or orbits are incomplete at the back, and the anterior upper premolars are present.

2.7.2 Distribution and Abundance

The historic range of the ocelot includes southern Texas and Arizona to northern Argentina (USFWS 1990). Virtually nothing is known of the ocelot in Arizona but reports of ocelots in southeastern Arizona warrant further investigation of its status in Arizona and northern Sonora.

2.7.3 Habitat

The ocelot inhabits desert-scrub communities in Arizona (AGFD 2004). The critical component in suitable habitat for the ocelot is dense cover. The minimum acreage required for an area to be classified as suitable habitat is 99 acres of brush or 74 acres of two or more proximate brush stands (USFWS 1990).

2.7.4 Threats

Threats to ocelot include habitat alteration and loss (primarily due to brush clearing), and predator control activities (AESFO 2002).

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3. ACTION AREA

The action area consists of those lands that will be directly and indirectly impacted by the Project and are known to be occupied or potentially occupied by six federally listed species: Huachuca water umbel, Gila topminnow, Chiricahua leopard frog, jaguar, lesser long-nosed bat, and ocelot. The action area is defined by a corridor that extends approximately 300 feet from construction access routes, staging areas, and construction sites. This is the area directly affected by the Project. The extension of 300 feet represents the approximate distance that Project-related noise is estimated to attenuate from approximately 80 A-weighted decibels (dBA) to approximate ambient noise levels of around 55 dBA. The action area includes areas directly and indirectly impacted by the primary pedestrian fence and access roads, the access road construction activities, and the construction staging areas (see **Figure 1-1** for a map of the action area). Tactical infrastructure would begin approximately 1 mile east of the DeConcini POE and extend 7.6 miles eastward across the Santa Cruz River and end near the western boundary of the Coronado National Forest.

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4. EFFECTS OF THE PROJECT

The following is an analysis of the effects of the Project. Implementation of the Project is likely to adversely affect the jaguar (*Panthera onca*) and lesser long-nosed bat (*Leptonycteris curasonae*) in Sections D-5B and D-6. The Project may affect, but is not likely to adversely affect: Huachuca water umbel (*Lilaeopsis schaffneriana* ssp. *Recurva*), Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*), Gila topminnow (*Poeciliopsis occidentalis occidentalis*), Chiricahua leopard frog (*Rana chiricahuensis*), and ocelot (*Leopardus pardalis*). Potentially suitable habitat exists within the Project corridor for the species listed above. However, none of these species were observed during the February and April 2008 surveys. Based on survey results and the implementation of BMPs, the Project is not likely to directly adversely affect individuals or populations of federally listed plants, but could directly affect potential habitat for these species. Implementing general and species-specific BMPs will help to avoid impacts on these species and their habitats (see **Section 1.3.2**).

4.1 JAGUAR

The Project may affect jaguar in Sections D-5B and D-6. Sightings have been documented west of the Project corridor within Coronado National Forest (DHS 2008). There are no known occurrences of this species within or immediately adjacent to the Project corridor (NatureServe 2008).

Project-related loss of habitat may affect this species. However, it is unknown to what extent jaguars are present in the area. Most jaguar detections occurred in Madrean oak woodland communities; however, jaguars were also documented in open mesquite grasslands and desert scrub/grasslands on the desert valley floor (USFWS 2007b). The permanent loss of 116 acres of vegetation includes 101 acres of scrub-grassland, 8 acres of madrean evergreen woodlands, less than 2 acres of cottonwood-willow, and 5 acres of riparian deciduous forest woodland. These habitat types represent suitable habitat for jaguar. However, the loss of 101 acres of desert scrub/grasslands, represents a relatively small percentage of this habitat type available in the area.

Tactical infrastructure associated with the Project could impede movements of jaguars across the border. Because jaguars in Arizona are believed to be part of a population in northern Mexico, preventing jaguar movement and exchange between the U.S. and Mexico would result in fragmentation of jaguar habitat. However, jaguar would be able to pass through Normandy-style vehicle fence that will be installed within the floodplain of the Santa Cruz River.

Human activity and elevated noise levels during construction would disturb any jaguar in the immediate area and possibly hinder or impede jaguar movements into the United States. Nighttime construction can temporarily affect foraging activity; however, construction activities are expected to be conducted during daylight hours to the maximum extent practicable.

Vehicle traffic, foot traffic, and the presence of cross-border violators can affect habitat by altering composition, structure, and function of habitat; however, changes in cross-border violator traffic patterns result from a variety of factors in addition to border patrol operations and, therefore, are considered unpredictable and beyond the scope of this BRP.

4.2 HUACHUCA WATER UMBEL

The Project may affect, but is not likely to adversely affect Huachuca water umbel in Sections D-5B and D-6. The species was not found during surveys (DHS 2008) and there are no known occurrences of this species within or immediately adjacent to the project corridor (NatureServe 2008).

Potential habitat exists within the Santa Cruz River system and in the Project corridor (GSRC 2008). However, placement of the temporary fence would not increase sedimentation or alter hydrology. The decision to install Normandy-style vehicle fence within the Santa Cruz River floodplain, rather than primary pedestrian fence, minimizes potential impacts on Huachuca water umbel. If the Project results in impacts on Huachuca water umbel habitat, CBP would mitigate, as appropriate.

There is also the potential for introduction of exotic plant species through construction activities and use of new and existing roads. Implementing general and species-specific BMPs will help to avoid impacts on Huachuca water umbel in Sections D-5B and D-6.

Vehicle traffic, foot traffic, and the presence of cross-border violators can affect habitat by altering composition, structure, and function of habitat; however, changes in cross-border violator traffic patterns result from a variety of factors in addition to border patrol operations and, therefore, are considered unpredictable and beyond the scope of this BRP.

4.3 PIMA PINEAPPLE CACTUS

The Project may affect, but is not likely to adversely affect Pima pineapple cactus in Sections D-5B and D-6. The species has the potential to occur within or near the Project corridor. NatureServe data indicate that Pima pineapple cactus occurs within a mile of the corridor at the eastern end and within 3 miles at the western end of the Project corridor (NatureServe 2008). Suitable habitat for the Pima pineapple cactus exists throughout the project area; however, recent surveys of the project corridor indicate that no Pima pineapple cactus specimens were observed within the project footprint (GSRC 2008).

Project-related loss of habitat is not likely to adversely affect this species because no specimens were located within the project footprint. However, the species grows in the transition zone between the semi-desert grasslands and Sonoran desertscrub, which comprises most of the Project area. There is also the potential for introduction of invasive plant species through construction

activities and use of new and existing roads. Implementing general and species-specific BMPs will help to avoid direct and indirect impacts on Pima pineapple cactus associated with invasive plant species in Sections D-5B and D-6.

Vehicle traffic, foot traffic, and the presence of cross-border violators can affect habitat by altering composition, structure, and function of habitat; however, changes in cross-border violator traffic patterns result from a variety of factors in addition to border patrol operations and, therefore, are considered unpredictable and beyond the scope of this BRP.

4.4 GILA TOPMINNOW

The Project is not likely to adversely affect the Gila topminnow in Sections D-5B and D-6. There are no known occurrences of this species within or immediately adjacent to the Project corridor (NatureServe 2008).

Potentially suitable habitat exists in the Santa Cruz River system; however, placement of the temporary fence would not increase sedimentation or alter hydrology. The decision to install Normandy-style vehicle fence within the Santa Cruz River floodplain, rather than primary pedestrian fence, minimizes potential impacts on the Gila topminnow. If the Project results in impacts on Gila topminnow habitat, CBP would mitigate, as appropriate.

4.5 CHIRICAHUA LEOPARD FROG

The Project is not likely to adversely affect the Chiricahua leopard frog in Sections D-5B and D-6. There are no known occurrences of this species within or immediately adjacent to the Project corridor (NatureServe 2008).

Potentially suitable habitat exists in perennial pools of the Santa Cruz River floodplain and its tributaries; however, placement of the temporary fence would not increase sedimentation or alter hydrology. The decision to install Normandy-style vehicle fence within the Santa Cruz River floodplain, rather than primary pedestrian fence, avoids and minimizes potential impacts on Chiricahua leopard frog. If the Project results in impacts on Chiricahua leopard frog, CBP would mitigate, as appropriate.

Management areas are identified in each Chiricahua leopard frog recovery unit where the potential for successful recovery actions is greatest. The eastern end of the proposed project corridor falls within the Chiricahua leopard frog Recovery Unit 2. However, it does not occur within a management area within this Recovery Unit. Management areas contain extant populations or sites where habitats will be restored or created, and populations of frogs established or re-established (USFWS 2007a). Because placement of temporary fence would not increase sediment or hydrology and because the fence corridor does not occur within a management areas, adverse impacts are not likely.

4.6 LESSER LONG-NOSED BAT

The Project may affect the lesser long-nosed bat in Sections D-5B and D-6. Potential foraging habitat exists within or near the Project corridor but no suitable roosting habitat is present (DHS 2008). However, these plants are not present in the Project corridor in dense aggregations. Additionally, there are no known occurrences of the lesser longer-nosed bats within or immediately adjacent to the Project corridor (NatureServe 2008).

The removal or damage of foraging plants for road and fence construction might adversely affect the species. Scattered small agave plants were identified within the Project corridor. Although the potential foraging habitat was found in the Project corridor, the potential for this species to occur is likely limited to an infrequent transit corridor to more suitable habitat. Additionally, the potential forage habitat in the Project corridor represents a relatively small percentage of the habitat in the area.

Impacts on potential foraging habitat could result from (1) introduction of non-native plant species through the construction process that could prevent the recruitment of plant forage species and could also carry fire that could further reduce number of forage plants, and (2) nighttime construction that could temporarily affect foraging activity. Construction of new tactical infrastructure has effects related to ground or surface disturbance for the infrastructure and the construction operations. The direct footprint for the infrastructure results in ground disturbances, vegetation removal, and soil compaction. Implementing general and species-specific BMPs will help to avoid impacts on the lesser long-nosed bat in Sections D-5B and D-6.

Nighttime construction can temporarily affect foraging activity; however, construction activities are expected to be conducted during daylight hours to the maximum extent practicable.

4.7 OCELOT

The Project may affect, but is not likely to adversely affect the ocelot in Sections D-5B and D-6. Recent sightings of ocelots have been reported in Mexico, about 30 miles south of Sections D-5B and D-6 (SIA 2008). There are no known occurrences of this species within or immediately adjacent to the Project corridor (NatureServe 2008).

Tactical infrastructure associated with the Project can impede movement of ocelots across the border and could result in fragmentation of ocelot habitat. However, ocelots would be able to pass through Normandy-style vehicle fence that will be installed within the floodplain of the Santa Cruz River.

Project-related loss of habitat is not likely to adversely affect this species because of the lack of occurrences in the area and the lack of dense cover. The critical component in suitable habitat for the ocelot is dense cover. The

permanent loss of 116 acres of vegetation associated with the Project includes 101 acres of scrub-grassland, 8 acres of Madrean evergreen woodlands, less than 2 acres of cottonwood-willow, and 5 acres of riparian deciduous forest woodland. Suitable ocelot habitat exists within densely vegetated areas within the Project corridor. Cottonwood-willow is unique to major washes and southwestern river systems and is potentially suitable ocelot habitat. The minimum acreage required for an area to be classified as suitable habitat is 99 acres of brush or 74 acres of two or more proximate brush stands (USFWS 1990).

Human activity and elevated noise levels during construction would disturb any jaguar in the immediate area and possibly hinder or impede ocelot movements into the United States. Nighttime construction can temporarily affect foraging activity; however, construction activities are expected to be conducted during daylight hours to the maximum extent practicable.

Vehicle traffic, foot traffic, and the presence of cross-border violators can affect habitat by altering composition, structure, and function of habitat; however, changes in cross-border violator traffic patterns result from a variety of factors in addition to border patrol operations and, therefore, are considered unpredictable and beyond the scope of this BRP.

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5. DETERMINATION OF EFFECT

Seventeen federally listed species are known to occur or potentially occur within 25 miles of the Project in Santa Cruz County, Arizona. **Table 5-1** outlines federally listed species and federally designated critical habitats known to occur or to potentially occur within or adjacent to the Project area and the determination of effects resulting from the Project. The Project may affect the jaguar (*Panthera onca*) and lesser long-nosed bat (*Leptonycteris curasonae*) in Sections D-5B and D-6. The Project may affect, but is not likely to adversely affect, the Huachuca water-umbel (*Lilaeopsis schaffneriana* ssp. *Recurva*), Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*), Gila topminnow (*Poeciliopsis occidentalis occidentalis*), Chiricahua leopard frog (*Rana chiricahuensis*), and ocelot (*Leopardus pardalis*) in Sections D-5B and D-6. The remaining species, the Canelo Hills ladies' tresses (*Spiranthes delitescens*), Stephan's riffle beetle (*Hetrelmis stephani*), Huachuca springsnail (*Pyrgulopsis thomsoni*), desert pupfish (*Cyprinodon macularius*), Gila chub (*Gila intermedia*), Sonora chub (*Gila ditaenia*), Sonora tiger salamander (*Ambystoma tigrinum stebbinsi*), Mexican spotted owl (*Strix occidentalis lucida*), southwestern willow flycatcher (*Empidonax traillii extimus*), and yellow-billed cuckoo (*Coccyzus americanus*) will not be affected by the Project.

The determination of no effect for impacts on the Canelo Hills ladies' tresses, Huachuca springsnail, Stephan's riffle beetle, desert pupfish, Gila chub, Sonora chub, Sonora tiger salamander, Mexican spotted owl, southwestern willow flycatcher, and yellow-billed cuckoo was based on the absence of known occurrences or suitable habitat in any sections of the Project. The determination of no effect for impacts on critical habitat for the Mexican spotted owl, southwestern willow flycatcher, and Huachuca water umbel is based on the fact that construction or maintenance activities will not occur within these critical habitat areas.

Vehicle traffic, foot traffic, and the presence of cross-border violators can affect habitat by altering composition, structure, and function of habitat; however, changes in cross-border violator traffic patterns result from a variety of factors in addition to border patrol operations and, therefore, are considered unpredictable and beyond the scope of this BRP.

Canelo Hills ladies' tresses. Habitat for this species includes finely grained, highly organic, saturated soils of cienegas. No suitable habitat is present within the Project corridor. Additionally, this species is found in the San Pedro watershed (USFWS 2008c). There are no known occurrences of this species within or immediately adjacent to the Project corridor (NatureServe 2008).

Table 5-1. Determination of Effects on Federally Listed Species and Critical Habitats within Sections D-5B and D-6

Species	Listing Status	Determination
PLANTS		
Canelo Hills ladies'-tresses, <i>Spiranthes delitescens</i>	Endangered	No effect
Huachuca water-umbel, <i>Lilaeopsis schaffneriana</i> ssp. <i>Recurva</i>	Endangered	Not likely to adversely affect
Pima pineapple cactus, <i>Coryphantha scheeri</i> var. <i>robustispina</i>	Endangered	Not likely to adversely affect
INVERTEBRATES		
Stephan's riffle beetle, <i>Hetrelmis stephani</i>	Candidate	No effect
Huachuca springsnail, <i>Pyrgulopsis thomsoni</i>	Candidate	No effect
FISH		
Desert pupfish, <i>Cyprinodon macularius</i>	Endangered	No effect
Gila chub, <i>Gila intermedia</i>	Endangered	No effect
Gila topminnow, <i>Poeciliopsis occidentalis</i> <i>occidentalis</i>	Endangered	Not likely to adversely affect
Sonora chub, <i>Gila ditaenia</i>	Threatened	No effect
AMPHIBIANS		
Chiricahua leopard frog, <i>Rana chiricahuensis</i>	Threatened	Not likely to adversely affect
Sonora tiger salamander, <i>Ambystoma tigrinum stebbinsi</i>	Endangered	No effect
BIRDS		
Mexican spotted owl, <i>Strix occidentalis lucida</i>	Threatened, with critical habitat designated east of the project corridor	No effect
Southwestern willow flycatcher, <i>Empidonax traillii extimus</i>	Endangered	No effect
Yellow-billed cuckoo, <i>Coccyzus americanus</i>	Candidate	No effect

Species	Listing Status	Determination
MAMMALS		
Jaguar, <i>Panthera onca</i>	Endangered	May affect
Lesser long-nosed bat, <i>Leptonycteris curasonae</i>	Endangered	May affect
Ocelot, <i>Leopardus pardalis</i>	Endangered	Not likely to adversely affect

Huachuca springsnail. Habitat for this species includes aquatic areas, small springs with vegetation and slow moderate flow (USFWS 2008c). No suitable habitat is present within the Project corridor. Additionally, the Project corridor is not located in known range for this species (USFWS/AESFO 2004a). There are no known occurrences of this species within or immediately adjacent to the Project corridor (NatureServe 2008).

Stephan's riffle beetle. Habitat for this species includes free-flowing springs and seeps (USFWS 2008c). No suitable habitat is present within the Project corridor. There are no known occurrences of this species within or immediately adjacent to the Project corridor (NatureServe 2008).

Desert pupfish. Habitat for this species includes shallow springs, small streams, and marshes. Native Arizona populations are located on Organ Pipe Cactus National Monument and additional refugia populations are north of the Project corridor (USFWS 2008c). There are no known occurrences of this species within or immediately adjacent to the Project corridor (NatureServe 2008).

Gila chub. Habitat for this species includes pools, springs, cienegas, and streams. The Project corridor is not located in known range for this species (USFWS/AESFO 2004b). There are no known occurrences of this species within or immediately adjacent to the Project corridor (NatureServe 2008).

Sonora chub. Habitat for this species includes perennial and intermittent shallow to moderate streams with boulders and cliffs (USFWS 2008c). No suitable habitat is present within the Project corridor. The Project corridor is not located in known range for this species (USFWS/AESFO 2004c). There are no known occurrences of this species within or immediately adjacent to the Project corridor (NatureServe 2008).

Sonora tiger salamander. Habitat for this species includes stock tanks and impounded cienegas in San Rafael Valley, Huachuca Mountains (USFWS 2008c). No suitable habitat is present within the Project corridor. The Project corridor is not located in known range for this species (USFWS/AESFO 2004d).

There are no known occurrences of this species within or immediately adjacent to the Project corridor (NatureServe 2008).

Mexican spotted owl. The determination of no effect on Mexican spotted owl is based on the fact that there are no known owl sites (Protected Activity Centers [PACs]) or Natureserve identified occurrences within or near the project corridor. PACs are delineated around known owl sites and include a minimum of 600 acres of the best nesting and roosting habitat. Mexican spotted owl habitat occurs in varied habitat, consisting of mature montane forest and woodland, shady wooded canyons, and steep canyons. Forested habitat, uneven-aged stands with a high canopy closure, high tree density, and a sloped terrain appear to be key habitat components. They can also be found in mixed conifer and pine-oak vegetation types. Generally, Mexican spotted owls nest in older forests of mixed conifer or ponderosa pine/Gambel oak. Nests are found in live trees in natural platforms (e.g., dwarf mistletoe brooms), snags, and on canyon walls. Elevation ranges from 4,100 to 9,000 feet (USFWS 2008c).

Critical habitat is designated east of project corridor, within the boundaries of the Coronado National Forest, Sierra Vista District. The Primary Constituent Elements (PCEs) for Mexican spotted owl include the presence of water; abundance of canyon walls with crevices, caves, and ledges; clumps or stringers of mixed conifer, pine-oak, pinyon-juniper, or riparian vegetation; and a high percentage of ground litter and woody debris. Specifically, mixed-conifer forest habitat dominated by Douglas-fir, pine-oak, and riparian forests with high tree diversity are important to the owl (USFWS 1995, USFWS 2004).

While suitable habitat for this species occurs within the Santa Cruz River floodplain of the proposed project corridor because forested and steep sloped terrain do exist in portions of the floodplain, this species was not observed during the February or April 2008 pedestrian field survey (GSRC 2008). Because there are no PACs or Natureserve identified occurrences within or near the project corridor the project will have no effect on this species (Natureserve 2008).

Southwestern willow flycatcher. There are no known occurrences of this species within or immediately adjacent to the Project corridor (NatureServe 2008). No suitable habitat is present within the Project corridor. Suitable habitat for the southwestern willow flycatcher is defined as a riparian area with all the components needed to provide conditions suitable for breeding flycatchers. These conditions are generally dense, mesic riparian shrub and tree communities 0.1 hectare or greater in size within floodplains large enough to accommodate riparian patches at least 10 meters wide (measured perpendicular to the channel). Potentially suitable habitat is defined as a riparian system that does not currently have all the components needed to provide conditions suitable for nesting flycatchers (as described above), but which could, if managed appropriately, develop these components over time (USFWS 2002). The cottonwood willow habitat that does occur does not provide the structural diversity, patch size, or density required for the southwestern willow flycatcher and is not suitable habitat. Although it is potentially suitable foraging and nesting

habitat, there are no plans to manage this habitat in this way in the reasonably foreseeable future (GSRC 2008). **Figure 5-1** provides a photograph of the cottonwood willow habitat that occurs within the Project corridor. Because this riparian corridor is not currently suitable habitat, the project would have no effect on the southwestern willow flycatcher.

Yellow-billed cuckoo. There are no known occurrences of this species within or immediately adjacent to the Project corridor (NatureServe 2008). Habitat for this species includes large blocks of riparian woodlands (e.g., cottonwood, willow, or tamarisk galleries) (USFWS 2008c). Dense understory foliage appears to be an important factor in nest site selection, while cottonwood trees are an important foraging habitat in areas where the species has been studied in California (AEFSO 2001). No suitable habitat is present within the Project corridor because the patches of cottonwood willow habitat in the project area are not large enough. Within the project area these habitat types are 2 to 3 trees wide, with no dense understory foliage, and no large cottonwood stands. See **Figures 5-1** and **5-2** for photographs of these habitat types within the Project corridor (GSRC 2008).



Source: GSRC 2008

Figure 5-1. Photograph of Cottonwood Willow Habitat



Source: GSRC 2008

Figure 5-2. Photograph of Riparian Deciduous Forest and Woodland, Broadleaf Series

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