



## Appendix C

### Biological Resources



# La Cholla Boulevard Ruthrauff Road to River Road

## Biological Review

July 2008

Pima County Department of Transportation  
Work Order No. 4LCITR



July 29, 2008

Mr. Dean Papajohn, PE  
Civil Engineering Manager  
Pima County Department of Transportation  
Public Works Building  
201 N. Stone Avenue, 4th Floor  
Tucson, AZ 85701

RE: Biological Review  
La Cholla Boulevard, Ruthrauff Road to River Road  
Work Order No. 4LCITR  
HDR Job No. 59914

Dear Mr. Papajohn:

We are pleased to submit this *Biological Review* for the above-referenced project. This report was prepared by René Tanner, Senior Environmental Planner, and was reviewed by Christine Jacobs-Donoghue, Senior Environmental Planner.

If you have any questions, please contact me at (520) 584-3632.

Sincerely,  
HDR Engineering, Inc.

Ted Buell, PE  
Project Manager

Reviewed by:

Christine Jacobs-Donoghue  
Senior Environmental Planner

# La Cholla Boulevard Ruthrauff Road to River Road

## Biological Review

July 2008



Prepared for:  
Pima County Department of Transportation  
201 N. Stone Avenue  
Tucson, AZ 85701  
Work Order No. 4LCITR

Prepared by:  
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HDR Project No. 59914



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## 1.0 Project Location

The Pima County Department of Transportation's (PCDOT's) La Cholla Boulevard, Ruthrauff Road to River Road, road widening project is located in unincorporated Pima County, Arizona. The project is approximately 1 mile long and begins approximately 0.3 mile south of Ruthrauff Road and ends at River Road (see Figures 1 and 2). The Tucson city limits are located to the south, approximately 0.9 miles south of the intersection of La Cholla Boulevard and Ruthrauff Road.

The project is within Sections 15, 16, 22, and 23 of Township 13 South, Range 13 East (Gila and Salt River Meridian from the United States Geological Survey 7.5 minute "Tucson North, AZ" Quadrangle).

Throughout this Biological Review, the term "project limits" describes the construction footprint (area of disturbance), while the term "project area" includes surrounding land outside of but adjacent to the project limits. The term "project vicinity" is used to denote a more expansive landscape context.

## 2.0 Project Description

La Cholla Boulevard was widened to six lanes from approximately River Road north to Omar Drive in 2006. PCDOT proposes to continue the widening of La Cholla Boulevard south from River Road to Ruthrauff Road, transforming it from a two-lane, undivided roadway to an urban, six-lane divided roadway. This project is funded by the citizen-approved Regional Transportation Plan. Construction is anticipated to begin in the summer of 2010 and last 18 to 24 months.

The project involves the complete reconstruction of the road. The new roadway will have six travel lanes, a multiuse lane in each direction, a raised and landscaped median, sidewalks, and pedestrian trail improvements from La Cholla Boulevard to the north bank of the Rillito River. The project will also include replacing the existing two-lane bridge over the Rillito River with a six-lane bridge. The intersections of La Cholla Boulevard with Curtis Road and Ruthrauff Road will include additional right- and left-turn lanes. The total length of the project is approximately 1 mile.

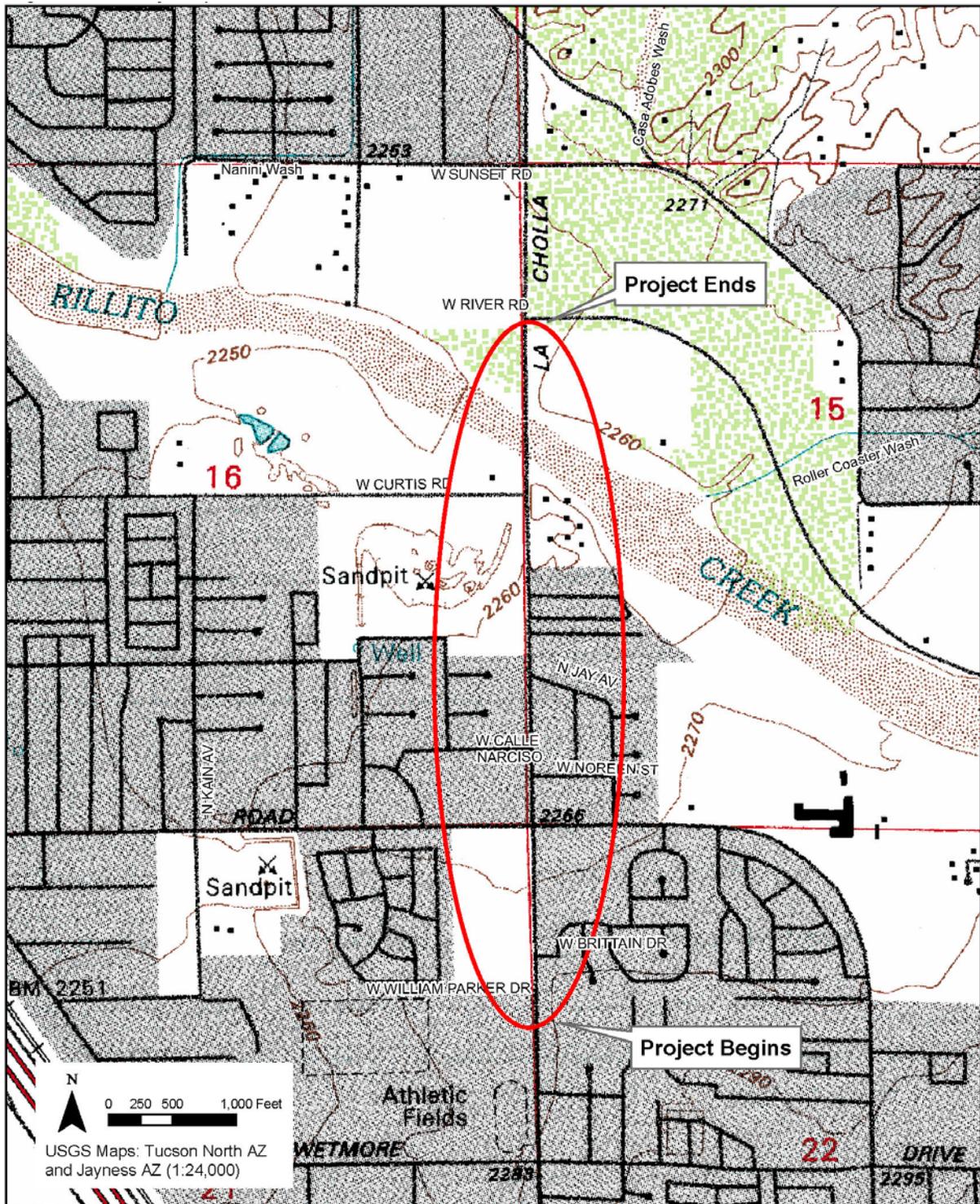
The Rillito River (conservation land) is located at the north end of the project and a cultural site (Hodges Ruins) at the south end of the project site. Due to these environmental and cultural conditions, this segment of La Cholla Boulevard corridor could be designated as an environmentally sensitive roadway and applicable design guidelines could be applied to the project. However, because the project area is predominantly urban and for the most part lacks native vegetation, environmentally sensitive roadway design guidelines were not applied to the project.

Traffic volumes on the roadway are expected to increase because of regional growth and expanded roadway capacity associated with the improvements. The increase in traffic volume will result in an increase in noise levels along the roadway. A separate noise report was prepared to evaluate noise and potential mitigation measures (HDR, Inc. 2008).





Figure 2. Project vicinity





Currently, the two-lane road has little to no access control and vehicles originating from residences and businesses can access La Cholla Boulevard from existing local streets. During construction, the project will create dust, noise, and traffic delays; however, access to businesses and residences will be maintained throughout the construction period and signs will be provided to identify business access points. No major detours or temporary roads would be constructed. Standard measures will be employed to reduce dust and noise during construction.

Project construction will require the acquisition of 0.43 acre of new right-of-way (R/W) from 3 parcels. Temporary construction easements will involve 1.63 acres of land from 49 parcels along the alignment. Staging areas will be determined by the contractor; however, any staging areas outside of the project area would need to be evaluated, by the contractor, prior to use, through a separate environmental analysis in accordance with Pima County, and state and federal requirements, unless the facility has already received prior clearance under local, state, and federal laws.

The project area has very limited vegetation, but does contain plant species subject to the County's Native Plant Preservation Ordinance and Arizona Native Plant Law, including mesquite, acacia, and palo verde. Applicable plants will be preserved in place, salvaged and relocated, or replaced, consistent with the Ordinance and the project landscape plan. The Arizona Department of Agriculture will be notified regarding plant removal.

Bridge construction over the Rillito River is expected to affect less than 0.5 acre of waters of the United States; therefore, if a Clean Water Act Section 404 permit is required, authorization under the terms and conditions of a United States Army Corps of Engineers' Nationwide Permit is anticipated. The Rillito River is the only potential water of the United States within the project area.

The project is expected to disturb more than 1 acre of soil; therefore, an Arizona Pollutant Discharge Elimination Permit from the Arizona Department of Environmental Quality and a stormwater pollution prevention plan (SWPPP) will be required. The SWPPP will involve implementing measures during construction that retain soil on site and prevent potential chemical spills that could contaminate soils. The SWPPP's implementation will not affect any listed species.

### **3.0 Location Description**

The project area is located within the Basin and Range Geologic Province. Landforms present within the Basin and Range Province consist of predominantly northwest-to-southwest trending, block-faulted mountain ranges, separated by broad, gently sloping alluvial basins. Terrain in the project vicinity is primarily flat. Elevations range between 2,260 and 2,280 feet above mean sea level within the project limits.

The project area is located within the Arizona Upland Subdivision of Sonoran Desertscrub (Turner and Brown 1994); however, the area is largely developed and graded so there is minimal vegetation within the project limits. A mixture of native and nonnative weedy species has recolonized some previously graded areas near the Rillito River bridge. Landscaping improvements are present north of the Rillito River bridge to the intersection of River Road and La Cholla Boulevard, along the Rillito River Park, and east of La Cholla



Boulevard along Ruthrauff Road. A list of native plants found within the project area is listed in Appendix A.

The Rillito River, at its crossing with La Cholla Boulevard, is a 300-foot-wide ephemeral stream with lined banks. The streambed is comprised of medium to coarse sand with some gravel and cobbles. The bed is vegetated with a typical assortment of desert vegetation.

The other watersheds that affect this roadway are fairly minor, with an aggregate size of about 60 acres. The main offsite watershed is roughly bordered by the Rillito River on the north, Casas Adobes Wash that runs parallel to and 1,300 feet east of La Cholla Boulevard on the east, Wetmore Road on the south, and La Cholla Boulevard on the west. Storm runoff generated within the watershed generally flows to the northwest in streets, roadside swales, and existing storm drains. The watershed is developed with single-family homes, mobile home parks, and light commercial developments. The vegetative cover consists of natural desert scrub, even in most of the residential areas where property owners have generally elected to maintain the desert appearance of their land in lieu of lawns or formal landscaping.

North of the Rillito River, a small drainage area is currently being built into a commercial office center on the southeast corner of La Cholla Boulevard and River Road. The development plan shows that the runoff will be collected and conveyed to the south through the soil cement bank protection directly into the Rillito River.

The Rillito River has a drainage area of approximately 900 square miles, upstream of La Cholla Boulevard. It drains the southern portion of the Santa Catalina Mountains, the eastern portion of the Rincon Mountains, as well as several hundred square miles of desert. Watershed elevations range from 2,200 to 9,200 feet. Watershed slopes range from less than 1% to almost vertical relief in the mountains.

The Tucson Basin is an extensive basin containing alluvium varying up to approximately 12,000 feet in thickness. The alluvium is highly variable and ranges from sand, gravel, and cobble deposits to silts, clays and heavily cemented sandy clay. Characteristics of granular soils include high hydraulic transmissivity.

Land uses in the project area include residential (single-family homes and mobile homes), commercial, municipal (fire station), parks, vacant land, and flood control/river. Commercial development is largely concentrated at Ruthrauff Road and River Road. Within the project limits there is a linear park on both sides of the Rillito River bridge, with access to Rillito River Park multi-use trails, and to Curtis Park, which is located on the northwest corner of Curtis Road and La Cholla Boulevard. Flowing Wells Middle School is located just south of the project limits.



## 4.0 Species Identification

The United States Fish and Wildlife Service's (USFWS's) list of federally listed species (Appendix B) and the Arizona Game and Fish Department's (AGFD's) list of special-status species (Appendix C) were reviewed by a qualified biologist, René Tanner, to determine if any species listed as endangered or threatened or identified as special-status have the potential to occur within the project area. The project will have no effect on species listed by the USFWS. Table 1 lists the exclusion justification for each species. Because the project will not impact federally listed species, consultation with the USFWS is not necessary. Table 2 contains a list of special-status species within 3 miles of the project area, as identified by the AGFD, and habitat requirements and recommendations for each species based on site specific conditions. Table 3 contains a list of species from Pima County's *Sonoran Desert Conservation Plan* along with habitat requirements and a comment section regarding a species potential to occur within the project area based on site specific conditions.



**Table 1.** Threatened and endangered species listed by USFWS for Pima County that do not occur in the project area

<b>Species Common name Scientific name</b>	<b>Status<sup>a</sup></b>	<b>Habitat requirements</b>	<b>Exclusion justification</b>
California brown pelican <i>Pelecanus occidentalis californicus</i>	PD	The subspecies is found on the Pacific Coast and associated islands. In Arizona, the species is found on many lakes and rivers. Elevation: varies	The subspecies is an uncommon transient in Arizona. In addition, there are no lakes or perennial waters within the project area.
Chiricahua leopard frog <i>Lithobates (Rana) chiricahuensis</i>	T	Require permanent or nearly permanent water sources such as streams, rivers, backwaters, ponds, and stock tanks that are mostly free of nonnative fish, crayfish, and bullfrogs. Elevation: 3,300–8,900 feet	There are no permanent or semipermanent water sources in the project limits.
Desert pupfish <i>Cyprinodon macularius</i>	E	Shallow springs, small streams, and marshes. Elevation: < 5,000 feet	There are no permanent or semipermanent water sources in the project limits.
Gila chub <i>Gila intermedia</i>	E	Pools, springs, cienegas, and streams. Elevation: 2,000–5,500 feet	There are no permanent or semipermanent water sources in the project limits.
Gila topminnow <i>Poeciliopsis occidentalis occidentalis</i>	E	Small streams, springs, and cienegas. Elevation: 4,500 feet	There are no permanent or semipermanent water sources in the project limits.
Huachuca water umbel <i>Lilaeopsis schaffneriana ssp. recurva</i>	E	Cienegas, perennial low gradient streams, and wetlands. Elevation: 3,500–6,500 feet	There are no permanent or semipermanent water sources in the project limits.
Jaguar <i>Panthera onca</i>	E	Found in Sonoran desertscrub up through subalpine conifer forest. Elevation: 1,600–9,000 feet	Very rare in Arizona. The level of human disturbance within the project area would preclude the species presence.
Kearney blue star <i>Amsonia kearneyana</i>	E	Found on west-facing drainages in the Baboquivari Mountains. Elevation: 3,600–3,800 feet	Range is extremely limited and does not extend into the project area.
Lesser long-nosed bat <i>Leptonycteris curasoae yerbabuena</i>	E	Desert scrub habitat with agave and columnar cacti present as food plants. Elevation: < 6,000 feet	There are few, if any, food plants in the project area.
Masked bobwhite <i>Colinus virginianus ridgewayi</i>	E	Desert grasslands with a diversity of dense native grasses, forbs, and brush. Elevation: 1,000–4,000 feet	Presently only known from reintroduced populations on Buenos Aires National Wildlife Refuge.
Mexican spotted owl <i>Strix occidentalis lucida</i>	T	Nests in canyons and dense forests with multilayered foliage structure. Elevation: 4,100–9,000 feet	No suitable habitat; no forests or wooded canyons.

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**Table 1.** Threatened and endangered species listed by USFWS for Pima County that do not occur in the project area (*continued*)

<b>Species Common name Scientific name</b>	<b>Status<sup>a</sup></b>	<b>Habitat requirements</b>	<b>Exclusion justification</b>
Nichol Turk’s head cactus <i>Echinocactus horizonthaloni</i> <i>var. nicholii</i>	E	Found in unshaded microsites in Sonoran desertscrub on dissected alluvial fans at the foot of limestone mountains and on inclined terraces and saddles on limestone mountain sides. Elevation: 2,400–4,100 feet	No suitable habitat; no alluvial fans or limestone present in the project area.
Ocelot <i>Leopardus (=Felis) pardalis</i>	E	Found in humid tropical and subtropical forests, savannahs, and semiarid thornscrub. Elevation: < 8,000 feet	No suitable habitat; no dense cover in the project area.
Pima pineapple cactus <i>Coryphantha scheeri</i> <i>var. robustispina</i>	E	Occurs in alluvial valleys or on hillsides in rocky to sandy or silty soils. Found in Sonoran desertscrub or semidesert grassland communities. Elevation: 2,300–5,000 feet	No suitable habitat; native vegetation has been cleared from the project limits.
Sonoran pronghorn <i>Antilocapra Americana sonoriensis</i>	E	Found in broad intermountain alluvial valleys with creosote-bursage and palo verde-mixed cacti associations. Elevation: 500–2,000 feet	No suitable habitat; human disturbance within the project area would preclude the species presence.
Southwestern willow flycatcher <i>Empidonax traillii extimus</i>	E	Cottonwood/willow and tamarisk vegetation communities along rivers and streams. Elevation: < 8,500 feet	No suitable habitat; the Rillito River does not support suitable riparian habitat in the project area.
Acuna cactus <i>Echinomastus erectocentrus</i> <i>var. acunensis</i>	C	Found on well-drained knolls and gravel ridges in Sonoran desertscrub Elevation: 1,300–2,000 feet	No suitable habitat; no knolls or gravel ridges in project area.
Sonoyta mud turtle <i>Kinosternon sonoriense longifemorale</i>	C	A pond turtle found in Quitobaquito Springs and Rio Sonoyta, Sonora, Mexico. Elevation: 1,100 feet	No suitable habitat; no permanent or semipermanent water in the project area.
Yellow-billed cuckoo <i>Coccyzus americanus</i>	C	Found in large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries). Elevation: < 5,500 feet	No suitable habitat; the Rillito River does not support suitable riparian habitat in the project area.
Gooddings onion <i>Allium gooddingii</i>	CA	Found in forested drainage bottoms and on moist north-facing slopes of mixed conifer and spruce fir forests. Elevation: > 7,500 feet	No suitable habitat; no forest habitat.
San Xavier talussnail <i>Sonorella eremita</i>	CA	Found on deep, limestone rockslides with outcrops of limestone and decomposed granite. Elevation: 3,850–3,920 feet	No suitable habitat; no limestone habitat.

Source: USFWS 2008. *Listed, protected, and candidate species for Pima County.*

<sup>a</sup> E = endangered, T = threatened, PD = proposed delisted, C = candidate, CA = conservation agreement



**Table 2.** Special status species occurring within 3 miles of the project vicinity as documented in the AGFD Heritage Data Management System

<b>Species Common name Scientific name</b>	<b>Status<sup>a</sup></b>	<b>Habitat requirements</b>	<b>Recommendation</b>
Bat colony	N/A	The existing bridge does not have expansion joints; therefore, bat habitat is not present.	No suitable habitat; therefore, no additional survey or mitigation measures are recommended.
Black-bellied whistling-duck <i>Dendrocygna autumnalis</i>	WSC	Prefers shallow freshwater ponds, lakes, and marshes, especially those that are lined with trees because tree cavities provide nesting sites. The species is known to breed in southeastern Arizona.	No suitable habitat; therefore, no mitigation measures or survey are recommended.
California leaf-nosed bat <i>Macrotus californicus</i>	WSC	The species is known to occur in the Coronado National Forest, Organ Pipe National Monument, Cabeza Prieta National Wildlife Refuge, Tucson Mountain Park, and Colossal Cave Mountain Park. No roost sites are located within project area.	No suitable roosting habitat; therefore, no mitigation measures or survey are recommended.
Great Plains narrow-mouthed toad <i>Gastrophryne olivacea</i>	WSC	Breeds in mesquite grasslands during the summer rains.	No suitable habitat; therefore, no mitigation measures or survey are recommended.
Thorner fishhook cactus <i>Mammillaria thornberi</i>	SR	The plant is found in desert and woodland habitats in Arizona south of the Mogollon Rim into Sonora.	Unlikely to occur because of past soil disturbance. If present, the plant will be salvaged in accordance with local and state guidelines.
Tumamoc globeberry <i>Tumamoca macdougallii</i>	SR	The plant is found along sandy washes in Sonoran desertscrub and Sinaloan thornscrub communities.	Unlikely to occur because of existing soil disturbance. Therefore, no mitigation measures or survey are recommended.
Western burrowing owl <i>Athene cunicularia hypugaea</i>	SC	Nests in areas of short, open scrublands. The owl is tolerant of human presence, and will nest in human-modified landscapes.	The banks of the Rillito River were reviewed for potential habitat. Because the banks are soil cemented and without scour sufficient for a burrow, no habitat was identified. However, the vacant lot on the southwest quadrant of the bridge will require a survey if ground disturbance occurs during the species breeding season (March through mid-July).
Western yellow-billed cuckoo <i>Coccyzus americanus</i>	WSC	Found in large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries).	No suitable habitat; therefore, no mitigation measures or survey are recommended.

<sup>a</sup> SC = species of concern (USFWS term), WSC = wildlife species of concern (AGFD term), SR = Salvage Restricted, N/A = not applicable



**Table 3.** Sonoran Desert Conservation Plan species with the potential to occur in the project area

<b>Species Common name Scientific name</b>	<b>Status</b>	<b>Habitat requirements</b>	<b>Comments</b>
Abert's towhee <i>Pipilo aberti</i>	Protected by the Migratory Bird Treaty Act	The species is found in dense riparian habitat and urban backyards.	Unlikely to occur. There is very little vegetation within the project limits.
Acuna cactus <i>Echinomastus erectocentrus</i> var. <i>acunensis</i>	Protected by Arizona Native Plant Law	Found on well-drained knolls and gravel ridges between major washes in Sonoran desertscrub.	Unlikely to occur. There is very little vegetation within the project limits.
Arizona shrew <i>Sorex arizonae</i>	WSC	No records of the species in Pima County. Species has been recorded in high mountain ranges in southeastern Arizona and western New Mexico.	Extremely unlikely to occur. No suitable habitat in the project area.
Bell's vireo <i>Vireo belli</i>	Protected by the Migratory Bird Treaty Act	Common summer resident in dense shrubs and trees within Pima County.	Unlikely to occur because of past vegetation removal.
Cactus ferruginous pygmy-owl <i>Glaucidium brasilianum cactorum</i>	WSC	The species is known to occupy a variety of vegetation communities from riparian habitat to semidesert grasslands.	Unlikely to occur. No suitable habitat in project area.
California leaf-nosed bat <i>Macrotis californicus</i>	WSC	Roosts in inactive mines and caves and occasionally in buildings.	Unlikely to occur. No potential roost sites in the project area.
Desert box turtle <i>Terrapene ornate luteola</i>	No federal or state status	Primarily a prairie turtle found in rolling grass and shrub lands.	Unlikely to occur. No suitable habitat.
Giant spotted whiptail <i>Cnemidophorus burti stictogrammus</i>	No federal or state status	Found in canyons and mesas. Formerly common in Sabino Canyon.	Unlikely to occur. No suitable habitat.
Lesser long-nosed bat <i>Leptonycteris curasoae yerbabuena</i>	Federally listed as endangered	Desert scrub habitat with agave and columnar cacti.	Unlikely to occur. No suitable habitat and forage plants.
Lowland leopard frog <i>Rana yavapaiensis</i>	WSC	Inhabits aquatic systems	Extremely unlikely to occur. No permanent surface water.
Merriam's mouse <i>Peromyscus merriami</i>	No federal or state status	Known primarily from heavy, forest-like mesquite bosques.	Unlikely to occur. No suitable habitat.
Mexican garter snake <i>Thamnophis eques megalops</i>	WSC	Inhabits areas of permanent water with vegetation.	Extremely unlikely to occur. No suitable habitat.

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**Table 3.** Sonoran Desert Conservation Plan species with the potential to occur in the project area (*continued*)

<b>Species Common name Scientific name</b>	<b>Potential to occur in project area</b>	<b>Habitat requirements</b>	<b>Comments</b>
Pale Townsend's bat <i>Plecotus townsendii</i>	No federal or state status	Roosts in inactive mines and caves and occasionally in buildings.	Unlikely to occur because there are no roost sites in the project area.
Rufous-winged sparrow <i>Aimophila carpalis</i>	Protected by the Migratory Bird Treaty Act	The species is fairly widespread in Pima County in Sonoran Desertscrub vegetation.	Unlikely to occur because there is minimal vegetation in the project area.
Southwestern willow flycatcher <i>Empidonax traillii extimus</i>	Federally listed as endangered	Cottonwood/willow and tamarisk vegetation communities along rivers and streams.	No suitable habitat; the Rillito River does not support suitable riparian habitat in the project area.
Swainson's hawk <i>Buteo swainsoni</i>	Protected by the Migratory Bird Treaty Act	Species breeds in open grassland habitats.	Unlikely to occur because there is minimal vegetation in the project area.
Tucson shovelnose snake <i>Chionactis occipitalis klauberi</i>	No federal or state status	Found on lowland valley floors in areas with sand and loose soil.	Unlikely to occur because of the existing soil disturbances and urban development.
Tumamoc globeberry <i>Tumamoca macdougallii</i>	SR	The plant is found along sandy washes in Sonoran desertscrub and Sinaloan thornscrub communities.	Unlikely to occur because of the existing soil disturbances and urban development.
Western burrowing owl <i>Athene cunicularia hypugaea</i>	SC	The species nests in areas of short, open scrublands. The owl is tolerant of human presence, and will nest in human-modified landscapes.	A vacant lot is located southwest of the bridge. A survey for the species is recommended if soil disturbance or equipment staging is expected at this location.
Western red bat <i>Lasiurus blossevillii</i>	WSC	Occurs along riparian corridors.	Unlikely to occur because suitable vegetation is lacking.
Western yellow bat <i>Lasiurus xanthinus</i>	WSC	Occurs along riparian corridors.	Unlikely to occur because suitable vegetation is lacking.
Western yellow-billed cuckoo <i>Coccyzus americanus occidentalis</i>	WSC	Found in large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries).	High potential area is mapped in the northeast quadrant of River Road and La Cholla Boulevard, which has been developed.

WSC = wildlife of special concern, SR = salvage restricted, SC = species of concern  
Source: Pima County Geographic Information System database



## 5.0 Species Evaluation and Cumulative Impacts

None of the federally listed species require further evaluation (see Table 1). Surveys for the cactus ferruginous pygmy-owl (pygmy-owl) were conducted with negative results in 2005 and 2006 by SWCA. Due to the lack of habitat in the project area, Pima County sought technical assistance from the USFWS regarding the need for pygmy-owl surveys. The USFWS concurred with Pima County that no suitable pygmy-owl habitat occurred in proximity to the project (Appendix D). Therefore, no additional surveys for the species will be conducted in the project area. In addition, the only species from Table 2 or 3 that requires further consideration is the western burrowing owl, which is addressed in Section 6.0 of this report.

No cumulative impacts on listed species are anticipated as a result of the project. While adjacent residential homes may eventually convert to businesses within the project limits, as a result of this project, this action would not create additional disturbances to viable habitat and therefore, would not contribute to a trend toward listing any species.

While this project will not affect endangered species, two species protected under the International Migratory Bird Treaty Act, the swallow and burrowing owl, will require consideration prior to construction. Remnants of mud swallow nests were observed on the underside of the bridge over the Rillito River on July 24, 2007. Prior to the swallow breeding season (approximately March through July), it is recommended that any nest remnants be removed from the bridge. In addition, it may be necessary to coat the underside of the bridge deck with plastic (Salmon and Gorenzel 2005) or some other material such as netting to prevent the birds from rebuilding their nests (Arizona Wings-N-Stings LLC).

The project area was reviewed for potential burrowing owl habitat and the AGFD was contacted for technical assistance regarding burrowing owl habitat and survey requirements (personal communication on 6/16/08 with Tim Snow of AGFD). AGFD indicated that burrowing owls use burrows excavated by other animals, such as ground squirrels. They generally nest in areas with low and open vegetation, which may increase their ability to detect predators. In addition, they can be found nesting in the banks of washes, even those with soil cement, if there has been sufficient scour to produce a nesting cavity. In addition to accommodating migrating burrowing owls, southern Arizona also has a resident population, and burrows may be used all year.

The banks of Rillito River are soil cemented and areas of scour sufficient for a burrow were not identified; therefore, no habitat for burrowing owls was identified along the banks of the Rillito River. Potential burrowing owl habitat was identified on a vacant lot at the northwest corner of Curtis Road and La Cholla Boulevard. The vacant lot has low and open native vegetation. Ground disturbance will occur at this location during the construction of a new path. The construction will require the acquisition of 50 feet of new R/W west of La Cholla Boulevard between Curtis Road and the Rillito River. Based on technical assistance from AGFD, preconstruction surveys for this area will be needed.



## 6.0 Recommendations

To avoid affects to swallows during construction it is recommended that:

- Bridge demolition be conducted outside of the swallow breeding season (after June and prior to March).
- Alternatively, if it is necessary to conduct bridge demolition during the breeding season (March through June), exclusion measures are needed. These measures include removing swallow nest remnants prior to the swallow breeding season, and preventing swallows from rebuilding their nests. More detail regarding exclusion measures is included in Appendix E. The swallow exclusion measures are ranked below based on their safety for birds:
  - The placement of plastic tarp across the bottom of the bridge to prevent nest attachment.
  - The placement of ¾ inch netting across the bottom of the bridge to prevent nest attachment.

To avoid affects to burrowing owls during construction it is recommended that:

- Ground disturbance at the northwest corner of La Cholla Boulevard and Curtis Road, be scheduled outside of the breeding season for the burrowing owl (after mid-July and prior to March).
- A burrowing owl survey be completed at the northwest corner of La Cholla Boulevard and Curtis Road at least 90 days before construction or equipment staging is expected at this location (AGFD 2008). If owls are absent during the 90 day survey, conduct a follow-up survey 30 days prior to planned activity to confirm continued absence of the owl.

## 7.0 Coordination

Pima County contacted the USFWS on September 25, 2007 to request technical assistance regarding the need to conduct cactus ferruginous pygmy-owl surveys for the project. The USFWS concurred with Pima County that no suitable pygmy-owl habitat occurred in proximity to the project (Appendix D).

The AGFD's Online Environmental Review Tool was accessed on September 27, 2007, to evaluate the potential effects of the project on species (Appendix C). No species listed by the USFWS required further analysis as a result of the data from the AGFD Heritage Data Management System. In addition, Tim Snow, non-game specialist with the AGFD, was contacted on June 16, 2008 for technical assistance regarding burrowing owl habitat. The results of his assessment are included in Section 5 of this document.

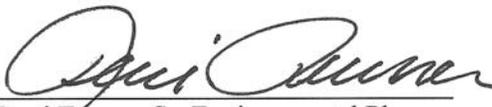


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## 8.0 Project Area Photographs

Appendix F includes representative ground photographs of the project area and an aerial photograph of the vacant lot on the northwest corner of Curtis Road and La Cholla Boulevard.

## 9.0 Signature

Prepared by:   
René Tanner, Sr. Environmental Planner

Date: *July 23, 2008*  
HDR Engineering, Inc.



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## 11.0 Abbreviation and Acronyms

<b>AGFD</b>	Arizona Game and Fish Department
<b>C</b>	candidate
<b>CA</b>	conservation agreement
<b>E</b>	endangered
<b>N/A</b>	not applicable
<b>PD</b>	proposed delisted
<b>SC</b>	species of concern
<b>SR</b>	salvage restricted
<b>SWPPP</b>	stormwater pollution prevention plan
<b>T</b>	threatened
<b>USFWS</b>	United States Fish and Wildlife Service
<b>WSC</b>	wildlife species of concern



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## Appendix A

### Protected Native Plants



**Appendix A.** Results of the native plant inventory for the La Cholla Boulevard: Ruthrauff Road to River Road project area. The inventory was prepared by McGann and Associates in accordance with the Pima County Zoning Code; Chapter 18.72. Protected Native Plants

<b>Common Name</b>	<b>Botanical Name</b>	<b>Quantity</b>
<i>Blue Palo Verde</i>	<i>Parkinsonia floridum</i>	8
<i>Velvet Mesquite</i>	<i>Prosopis velutina</i>	10
<i>Catclaw Acacia</i>	<i>Acacia greggii</i>	3
<i>Desert Willow</i>	<i>Chilopsis linearis</i>	5
<i>Saguaro</i>	<i>Carnegiea gigantea</i>	1



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## Appendix B

### USFWS List of Federally Listed Species

# Pima County

COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
California Brown pelican	<i>Pelecanus occidentalis californicus</i>	Proposed delisted	Large dark gray-brown water bird with a pouch underneath long bill and webbed feet. Adults have a white head and neck, brownish black breast, and silver gray upper parts.	Apache, Cochise, Coconino, Gila, Graham, Greenlee, La Paz, Maricopa, Mohave, Navajo, Pima, Pinal, Santa Cruz, Yavapai, Yuma	Varies	Coastal land and islands; species found around many Arizona lakes and rivers.	Subspecies is found on Pacific Coast and is endangered due to pesticides. It is an uncommon transient in Arizona on many Arizona lakes and rivers. Individuals wander up from Mexico in summer and fall. No breeding records in Arizona.
Chiricahua leopard frog	<i>Lithobates [Rana] chiricahuensis</i>	Threatened	Cream colored tubercles (spots) on a dark background on the rear of the thigh, dorsolateral folds that are interrupted and deflected medially, and a call given out of water distinguish this spotted frog from other leopard frogs.	Apache, Cochise, Coconino, Gila, Graham, Greenlee, Navajo, Pima, Santa Cruz, Yavapai	3,300-8,900 ft	Streams, rivers, backwaters, ponds, and stock tanks that are mostly free from introduced fish, crayfish, and bullfrogs.	Require permanent or nearly permanent water sources. Populations north of the Gila River may be a closely-related, but distinct, undescribed species. A special rule allows take of frogs due to operation and maintenance of livestock tanks on State and private lands.
Desert pupfish	<i>Cyprinodon macularius</i>	Endangered	Small (2 inches) smoothly rounded body shape with narrow vertical bars on the sides. Breeding males blue on head and sides with yellow on tail. Females and juveniles tan to olive colored back and silvery sides.	Cochise, Graham, La Paz, Maricopa, Pima, Pinal, Santa Cruz, Yavapai	< 5,000 ft	Shallow springs, small streams, and marshes. Tolerates saline and warm water.	Critical habitat includes Quitobaquito Springs, Pima County, portions of San Felipe Creek, Carrizo Wash, and Fish Creek Wash, Imperial County, California. Two subspecies are recognized: Desert Pupfish ( <i>C.m.macularis</i> ) and Quitobaquito Pupfish ( <i>C.m.ereumus</i> ).
Gila chub	<i>Gila intermedia</i>	Endangered	Deep compressed body, flat head. Dark olive-gray color above, silver sides. Endemic to Gila River Basin.	Cochise, Coconino, Gila, Graham, Greenlee, Maricopa, Pima, Pinal, Santa Cruz, Yavapai	2,000 - 5,500 ft	Pools, springs, cienegas, and streams.	Found on multiple private lands, including the Nature Conservancy, the Audubon Society, and others. Also occurs on Federal and state lands and in Sonora, Mexico. Critical habitat occurs in Cochise, Gila, Graham, Greenlee, Pima, Pinal, Santa Cruz and Yavapai counties.
Gila topminnow	<i>Poeciliopsis occidentalis occidentalis</i>	Endangered	Small (2 inches), guppy-like, live bearing, lacks dark spots on its fins. Breeding males are jet black with yellow fins.	Cochise, Gila, Graham, La Paz, Maricopa, Pima, Pinal, Santa Cruz, Yavapai	< 4,500 ft	Small streams, springs, and cienegas vegetated shallows.	Species historically occurred in backwaters of large rivers but is currently isolated to small streams and springs.

COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
Huachuca water umbel	<i>Lilaeopsis schaffneriana</i> ssp. <i>recurva</i>	Endangered	Herbaceous, semi-aquatic perennial in the parsley family (Umbelliferae) with slender erect, hollow, leaves that grow from the nodes of creeping rhizomes. Flower: 3 to 10 flowered umbels arise from root nodes.	Cochise, Pima, Santa Cruz	3,500-6,500 ft	Cienegas, perennial low gradient streams, wetlands.	Species also occurs in adjacent Sonora, Mexico, west of the continental divide. Critical habitat in Cochise and Santa Cruz counties (64 FR 37441, July 12, 1999).
Jaguar	<i>Panthera onca</i>	Endangered	Largest species of cat native to Southwest. Muscular, with relatively short, massive limbs, and a deep-chested body. Usually cinnamon-buff in color with many black spots. Weights ranges from 40-135 kg (90-300 lbs).	Cochise, Santa Cruz, Pima	1,600 - 9,000 ft	Found in Sonoran desertscrub up through subalpine conifer forest.	Also occurs in New Mexico. A Jaguar conservation team is being formed that is being led by Arizona and New Mexico state entities along with private organizations.
Kearney blue star	<i>Amsonia kearneyana</i>	Endangered	A herbaceous perennial about 2 feet tall in the dogbane family (Apocynaceae). Thickened woody root and many pubescent (hairy) stems that rarely branch. Flowers: white terminal inflorescence in April and May.	Pima	3,600-3,800 ft	West-facing drainages in the Baboquivari Mountains.	Plants grow in stable, partially shaded, coarse alluvium along a dry wash in the Baboquivari Mountains. Range is extremely limited. Protected by Arizona Native Plant Law.
Lesser long-nosed bat	<i>Leptonycteris curasoae yerbabuena</i>	Endangered	Elongated muzzle, small leaf nose, and long tongue. Yellowish brown or gray above and cinnamon brown below. Tail minute and appears to be lacking. Easily disturbed.	Cochise, Gila, Graham, Greenlee, Pima, Pinal, Maricopa, Santa Cruz, Yuma	< 6,000 ft	Desert scrub habitat with agave and columnar cacti present as food plants.	Day roosts in caves and abandoned tunnels. Forages at night on nectar, pollen, and fruit of paniculate agaves and columnar cacti. This species is migratory and is present in Arizona usually from April to September and south of the border the remainder of the year.
Masked bobwhite	<i>Colinus virginianus ridgewayi</i>	Endangered	Males brick-red breast and black head and throat. Females are generally nondescript but resemble other races such as the Texas bobwhite.	Pima	1,000-4,000 ft	Desert grasslands with diversity of dense native grasses, forbs, and brush.	Species is closely associated with Prairie acacia ( <i>Acacia angustissima</i> ). Formerly occurred in Altar and Santa Cruz valleys, as well as Sonora, Mexico. Presently only known from reintroduced populations on Buenos Aires NWR.

COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
Mexican spotted owl	<i>Strix occidentalis lucida</i>	Threatened	Medium sized with dark eyes and no ear tufts. Brownish and heavily spotted with white or beige.	Apache, Cochise, Coconino, Gila, Graham, Greenlee, Maricopa, Mohave, Navajo, Pima, Pinal, Santa Cruz, Yavapai	4,100-9,000 ft	Nests in canyons and dense forests with multi-layered foliage structure.	Generally nest in older forests of mixed conifer or ponderosa pine/gambel oak type, in canyons, and use variety of habitats for foraging. Sites with cool microclimates appear to be of importance or are preferred. Critical habitat was finalized on August 31, 2004 (69 FR 53182) in Arizona in Apache, Cochise, Coconino, Gila, Graham, Greenlee, Maricopa, Navajo, Pima, Pinal, Santa Cruz, and Yavapai counties.
Nichol Turk's head cactus	<i>Echinocactus horizontalonius var. nicholii</i>	Endangered	Blue-green to yellowish-green, columnar, 18 inches tall, 8 inches in diameter. Spine clusters have 5 radial and 3 central spines; one downward short; 2 spines upward and red or vasally gray. Flower: pink fruit: woolly white.	Pima, Pinal	2,400-4,100 ft	Sonoran desertscrub.	Found in unshaded microsites in Sonoran desertscrub on dissected alluvial fans at the foot of limestone mountains and on inclined terraces and saddles on limestone mountain sides.
Ocelot	<i>Leopardus (=Felis) pardalis</i>	Endangered	Medium-sized spotted cat whose tail is about 1/2 the length of head and body. Yellowish with black streaks and stripes running from front to back. Tail is spotted and face is less heavily streaked than the back and sides.	Cochise, Pima, Santa Cruz	< 8,000 ft	Humid tropical and subtropical forests, savannahs, and semi-arid thornscrub.	May persist in partly-cleared forests, second-growth woodland, and abandoned cultivated areas reverted to brush. Universal component is presence of dense cover. Unconfirmed reports of individuals in the southern part of the State continue to be received.
Pima pineapple cactus	<i>Coryphantha scheeri var. robustispina</i>	Endangered	Hemispherical stems 4-7 inches tall 3-4 inches diameter. Central spine 1 inch long straw colored hooked surrounded by 6-15 radial spines. Flower: yellow, salmon, or rarely white narrow floral tube.	Pima, Santa Cruz	2,300-5,000 ft	Sonoran desertscrub or semi-desert grassland communities.	Occurs in alluvial valleys or on hillsides in rocky to sandy or silty soils. This species can be confused with juvenile barrel cactus ( <i>Ferocactus</i> ). However, the spines of the later are flattened, in contrast with the round cross-section of the <i>Coryphantha</i> spines. 80-90% of individuals on state or private land.
Sonoran pronghorn	<i>Antilocapra americana sonoriensis</i>	Endangered	Buff on back and white below, hooped with slightly curved black horns having a single prong. Smallest and palest of the pronghorn subspecies	Pima, Yuma	500 - 2,000 ft	Broad intermountain alluvial valleys with creosote-bursage and palo verde-mixed cacti associations.	Typically, bajadas are used as fawning areas and sandy dune areas provide food seasonally. Historical range was probably larger than exists today. This subspecies also occurs in Mexico.

COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
Southwestern willow flycatcher	<i>Empidonax traillii extimus</i>	Endangered	Small passerine (about 6 inches) grayish-green back and wings, whitish throat, light olive-gray breast and pale yellowish belly. Two wingbars visible. Eye-ring faint or absent.	Apache, Cochise, Coconino, Gila, Graham, Greenlee, La Paz, Maricopa, Mohave, Navajo, Pima, Pinal, Santa Cruz, Yavapai, Yuma	<8,500 ft	Cottonwood/willow and tamarisk vegetation communities along rivers and streams.	Migratory riparian-obligate species that occupies breeding habitat from late April to September. Distribution within its range is restricted to riparian corridors. Difficult to distinguish from other members of the Empidonax complex by sight alone. Training seminar required for those conducting flycatcher surveys. Critical habitat was finalized on October 19, 2005 (50 CFR 60886). In Arizona there are critical habitat segments in Apache, Cochise, Gila, Graham, Greenlee, Maricopa, Mohave, Pima, Pinal, and Yavapai counties.
Acuna cactus	<i>Echinomastus erectocentrus var. acunensis</i>	Candidate	<12 inches high; spine clusters borne on tubercles, each with a groove on the upper surface. 2-3 central spines and 12 radial spines. Flowers pink to purple.	Pima, Pinal	1,300-2,000 ft	Well drained knolls and gravel ridges in Sonoran desertscrub.	Immature plants distinctly different from mature plants. They are disc-shaped or spherical and have no central spines until they are about 1.5 inches. Radial spines are dirty white with maroon tips.
Sonoyta mud turtle	<i>Kinosternon sonoriense longifemorale</i>	Candidate	Primarily a pond turtle, prefers mud or sandy bottoms. Body 3 1/2 to 6 1/2 inches. Head and neck mottled with contrasting light and dark markings. Found in Quitobaquito Springs.	Pima	1,100 ft	Ponds and streams.	Species also found in Rio Sonoyta, Sonora, Mexico.

COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	Candidate	Medium-sized bird with a slender, long-tailed profile, slightly down-curved bill, which is blue-black with yellow on the lower half of the bill. Plumage is grayish-brown above and white below, with rufous primary flight feathers.	Apache, Cochise, Coconino, Gila, Graham, Greenlee, La Paz, Maricopa, Mohave, Navajo, Pima, Pinal, Santa Cruz, Yavapai, Yuma	< 6,500 ft	Large blocks of riparian woodlands (cottonwood, willow, or tamarisk galleries).	Yellow-billed cuckoos are a neotropical migrant, wintering in primarily South America and breeding primarily in the United States (but also in southern Canada and northern Mexico). As a migrant it is rarely detected, but can occur outside of riparian areas. Cuckoos are found nesting statewide in Arizona below 7000 feet in elevation, but are mostly found below 5000 feet in central, western, and southeastern Arizona. Concern for cuckoos are primarily focused upon alterations to its nesting and foraging habitat. Nesting cuckoos are associated with relatively dense wooded streamside riparian habitat, with varying combinations of Fremont cottonwood, willow, velvet ash, Arizona walnut, mesquite, and tamarisk. Some cuckoos have also been detected nesting in velvet mesquite, netleaf hackberry, Arizona sycamore, Arizona alder, and some exotic neighborhood shade trees.
Gooddings onion	<i>Allium gooddingii</i>	Conservation Agreement	Herbaceous perennial plant; broad, flat, rather blunt leaves; flowering stalk 14-17 inches tall, flattened, and narrowly winged toward apex; fruit is broader than long; seeds are short and thick.	Apache, Greenlee, Pima	> 7,500 ft	Forested drainage bottoms and on moist north facing slopes of mixed conifer and spruce fir forests.	Conservation agreement between the Service and the Forest Service signed in February 1998. In New Mexico on the Lincoln and Gila National Forests.
San Xavier talussnail	<i>Sonorella eremita</i>	Conservation Agreement	Land snail, less than one inch in diameter (about .75 inches), 4.5 whorls, round shell, white to pinkish tint.	Pima	3,850-3,920 ft	Deep, limestone rockslide with outcrops of limestone and decomposed granite.	Conservation agreement signed by the Service, Arizona Game and Fish Department, El Paso Natural Gas Company, and Arizona Electric Power Cooperative, Inc. in September 1998.

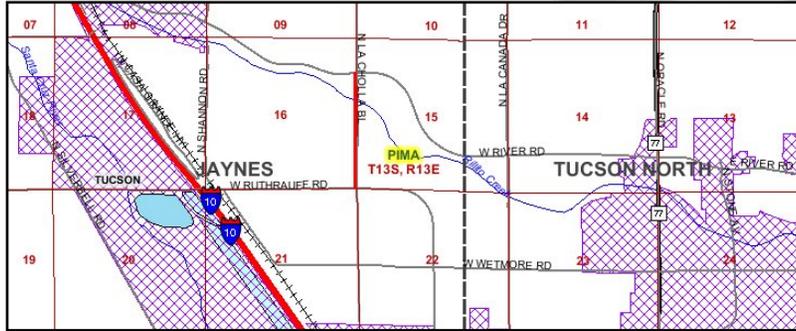


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## Appendix C

### AGFD Online Environmental Review Tool

**Project Location**



The Department appreciates the opportunity to provide in-depth comments and project review when additional information or environmental documentation becomes available.

**Special Status Species Occurrences/Critical Habitat/Tribal Lands within 3 miles of Project Vicinity:**

Name	Common Name	ESA	USFS	BLM	State
<i>Athene cucularia hypugaea</i>	Western Burrowing Owl	SC		S	
Bat Colony					
<i>Coccyzus americanus occidentalis</i>	Western Yellow-billed Cuckoo	C	S		WSC
<i>Dendrocygna autumnalis</i>	Black-bellied Whistling-Duck				WSC
<i>Gastrophryne olivacea</i>	Great Plains Narrow-mouthed Toad				WSC
<i>Macrotus californicus</i>	California Leaf-nosed Bat	SC			WSC
<i>Mammillaria thornberi</i>	Thornber Fishhook Cactus				SR
<i>Tumamoca macdougallii</i>	Tumamoc Globeberry		S	S	SR

**Project Name:** La Cholla: River Road to Ruthrauff Road  
**Submitted By:** Rene Tanner  
**On behalf of:** PCDOT  
**Project Search ID:** 20070927004021  
**Date:** 9/27/2007 1:28:10 PM  
**Project Category:** Transportation & Infrastructure, Road construction (including staging areas), Road widening (shoulders or additional or new lanes)  
**Project Coordinates (UTM Zone 12-NAD 83):** 498846.083, 3573484.604 meter  
**Project Length:** 1229.328 meter  
**County:** PIMA  
**USGS 7.5 Minute Quadrangle ID:** 1727  
**Quadrangle Name:** JAYNES  
**Project locality is not anticipated to change**

**Location Accuracy Disclaimer**

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

Arizona's On-line Environmental Review Tool  
Search ID: 20070927004021  
Project Name: La Cholla: River Road to Ruthrauff Road  
Date: 9/27/2007 1:28:25 PM

**Please review the entire receipt for project type recommendations and/or species or location information and retain a copy for future reference.** If any of the information you provided did not accurately reflect this project, or if project plans change, another review should be conducted, as this determination may not be valid.

**Arizona's On-line Environmental Review Tool:**

1. This On-line Environmental Review Tool inquiry has generated recommendations regarding the potential impacts of your project on Special Status Species (SSS) and other wildlife of Arizona. SSS include all U.S. Fish and Wildlife Service federally listed, U.S. Bureau of Land Management sensitive, U.S. Forest Service sensitive, and Arizona Game and Fish Department (Department) recognized species of concern.
2. These recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation). These recommendations are preliminary in scope, designed to provide early considerations for all species of wildlife, pertinent to the project type you entered.
3. This receipt, generated by the automated On-line Environmental Review Tool does not constitute an official project review by Department biologists and planners. Further coordination may be necessary as appropriate under the National Environmental Policy Act (NEPA) and/or the Endangered Species Act (ESA).

The U.S. Fish and Wildlife Service (USFWS) has regulatory authority over all federally listed species under the ESA. Contact USFWS Ecological Services Offices: <http://arizonaes.fws.gov/>.

Phoenix Main Office  
2321 W. Royal Palm Road, Suite 103  
Phoenix, AZ 85021  
Phone 602-242-0210  
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Tucson Sub-Office  
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Flagstaff Sub-Office  
323 N. Leroux Street, Suite 101  
Flagstaff, AZ 86001  
Phone 928-226-0614  
Fax 928-226-1099

**Disclaimer:**

1. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area.
2. The Department's Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there.
3. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. HDMS data contains information about species occurrences that have actually been reported to the Department.

**Arizona Game and Fish Department Mission**

**To conserve, enhance, and restore Arizona's diverse wildlife resources and habitats through aggressive protection and**

***management programs, and to provide wildlife resources and safe watercraft and off-highway vehicle recreation for the enjoyment, appreciation, and use by present and future generations.***

## **Project Category: Transportation & Infrastructure, Road construction (including staging areas), Road widening (shoulders or additional or new lanes)**

### **Project Type Recommendations:**

Based on the project type entered; coordination with State Historic Preservation Office may be required  
<http://www.pr.state.az.us/partnerships/shpo/shpo.html#anchor561695>

Based on the project type entered; coordination with U.S. Army Corps of Engineers may be required  
(<http://www.spl.usace.army.mil/regulatory/phonedir.html>)

During planning and construction, minimize potential introduction or spread of exotic invasive species. Invasive species can be plants, animals (exotic snails), and other organisms (e.g. microbes), which may cause alteration to ecological functions or compete with or prey upon native species and can cause social impacts (e.g. livestock forage reduction, increase wildfire risk). The terms noxious weed or invasive plants are often used interchangeably. Precautions should be taken to wash all equipment utilized in the project activities before leaving the site. Arizona has noxious weed regulations (Arizona Revised Statutes, Rules R3-4-244 and R3-4-245). See Arizona

Department of Agriculture website for restricted plants <http://www.azda.gov/PSD/quarantine5.htm>. Additionally, the U.S. Department of Agriculture has information regarding pest and invasive plant control methods including: pesticide, herbicide, biological control agents, and mechanical control: <http://www.usda.gov/wps/portal/usdahome>. The Department regulates the importation, purchasing, and transportation of wildlife and fish (Restricted Live Wildlife), please refer to the hunting regulations for further information [http://www.azgfd.gov/h\\_f/hunting\\_rules.shtml](http://www.azgfd.gov/h_f/hunting_rules.shtml).

During the planning stages of your project, please consider the local or regional needs of wildlife in regards to movement, connectivity, and access to habitat needs. Loss of this permeability prevents wildlife from accessing resources, finding mates, reduces gene flow, prevents wildlife from re-colonizing areas where local extirpations may have occurred, and ultimately prevents wildlife from contributing to ecosystem functions, such as pollination, seed dispersal, control of prey numbers, and resistance to invasive species. In many cases, streams and washes provide natural movement corridors for wildlife and should be maintained in their natural state. Uplands also support a large diversity of species, and should be contained within important wildlife movement corridors. In addition, maintaining biodiversity and ecosystem functions can be facilitated through improving designs of structures, fences, roadways, and culverts to promote passage for a variety of wildlife.

Hydrological considerations: design culverts to minimize impacts to channel geometry, or design channel geometry (low flow, overbank, floodplains) and substrates to carry expected discharge using local drainages of appropriate size as templates. Aquatic wildlife considerations: reduce/minimize barriers to migration of amphibians or fish (e.g. eliminate falls). Terrestrial wildlife: washes and stream corridors often provide important corridors for movement. Overall culvert width, height, and length should be optimized for movement of the greatest number and diversity of species expected to utilize the passage. Culvert designs should consider moisture, light, and noise,

while providing clear views at both ends to maximize utilization. For many species, fencing is an important design feature that can be utilized with culverts to funnel wildlife into these areas and minimize the potential for roadway collisions. Please contact the Project Evaluation Program for further fencing and culvert design recommendations and specifications.

Recommendations will be dependant upon goals of the fence project and the wildlife species expected to be impacted by the project. Please contact the Project Evaluation Program for further fencing recommendations and specifications.

The Department recommends that wildlife surveys are conducted to determine if noise-sensitive species occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

The Department requests further coordination to provide project/species specific recommendations, please contact Project Evaluation Program directly.

Vegetation restoration projects (including treatments of invasive or exotic species) should have a completed site-evaluation plan (identifying environmental conditions necessary to re-establish native vegetation), a revegetation plan (species, density, method of establishment), a short and long-term monitoring plan, including adaptive management guidelines to address needs for replacement vegetation.

**Project Location and/or Species recommendations:**

HDMS records indicate that one or more listed, proposed, or candidate species or Critical Habitat (Designated or Proposed) have been documented in the vicinity of your project (refer to page 1 of the receipt). Please contact:

Ecological Services Office  
US Fish and Wildlife Service

2321 W. Royal Palm Rd.  
Phoenix, AZ 85021-4951  
Phone: 602-242-0210  
Fax: 602-242-2513

HDMS records indicate that one or more native plants listed on the Arizona Native Plant Law and Antiquities Act have been documented within the vicinity of your project area (refer to page 1 of the receipt). Please contact:

Arizona Department of Agriculture

1688 W Adams  
Phoenix, AZ 85007  
Phone: 602-542-4373

HDMS records indicate that western burrowing owls have been documented within the vicinity of your project area (refer to the species list on page 1 of the receipt). Please review the relocation procedures recommended for burrowing owls found on the Environmental Review Home Page.

[http://mirror-pole.com/burr\\_owl/bur\\_owl1.htm](http://mirror-pole.com/burr_owl/bur_owl1.htm)

**Recommendations Disclaimer:**

1. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information

submitted for your proposed project.

2. These recommendations are proposed actions or guidelines to be considered during **preliminary project development**.

3. Additional site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies.

4. Making this information directly available does not substitute for the Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.

5. The Department is interested in the conservation of all fish and wildlife resources, including those Special Status Species listed on this receipt, and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.

6. **Further coordination requires the submittal of this Environmental Review Receipt with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map).**

7. Upon receiving information by AZGFD, please allow 30 days for completion of project reviews. Mail requests to:

**Project Evaluation Program, Habitat Branch  
Arizona Game and Fish Department  
2221 West Greenway Road  
Phoenix, Arizona 85023-4312  
Phone Number: (602) 789-3600  
Fax Number: (602) 789-3928**

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1. This Environmental Review and project planning website was developed and intended for the purpose of screening projects for potential impacts on resources of special concern. By indicating your agreement to the terms of use for this website, you warrant that you will not use this website for any other purpose.
2. Unauthorized attempts to upload information or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act .
3. The Department reserves the right at any time, without notice, to enhance, modify, alter, or suspend the website and to terminate or restrict your access to the website.
4. This Environmental Review is based on the project study area that was entered. The review must be redone if the project study area, location, or the type of project changes. If additional information becomes available, this review may need to be reconsidered.

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This website maintains a record of each environmental review search result as well as all contact information. This information is maintained

Arizona's On-line Environmental Review Tool  
Search ID: 20070927004021  
Project Name: La Cholla: River Road to Ruthrauff Road  
Date: 9/27/2007 1:28:25 PM

for internal tracking purposes. Information collected in this application will not be shared outside of the purposes of the Department.

City, State, Zip: \_\_\_\_\_

If the Environmental Review Receipt and supporting material are not mailed to the Department or other appropriate agencies within six (6) months of the Project Review Receipt date, the receipt is considered to be null and void, and a new review must be initiated.

Phone: \_\_\_\_\_

E-mail: \_\_\_\_\_

Print this Environmental Review Receipt using your Internet browser's print function and keep it for your records. Further coordination requires the submittal of this Environmental Review Receipt with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map).

Please provide point of contact information regarding this Environmental Review.

*Application or organization responsible for project implementation*

Agency/organization: \_\_\_\_\_

Contact Name: \_\_\_\_\_

Address: \_\_\_\_\_



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## Appendix D

### Letter from USFWS Regarding Technical Assistance



## United States Department of the Interior

U.S. Fish and Wildlife Service  
Arizona Ecological Services Field Office  
2321 West Royal Palm Road, Suite 103  
Phoenix, Arizona 85021-4951



Telephone: (602) 242-0210 Fax: (602) 242-2513

In Reply Refer to:

AESO/SE  
22410-2008-TA-0004

October 1, 2007

Ms. Karla Reeve-Wise  
Pima County Department of Transportation  
201 North Stone Avenue, Third Floor  
Tucson, Arizona 85701-1207

Dear Ms. Reeve-Wise:

Thank you for your September 25, 2007 request for technical assistance related to two road projects: 1) La Cholla Boulevard – River Road to Ruthrauff Road and 2) Shannon Road – south of Curtis Road to south of the Rillito River. Specifically, you requested our input on the need to continue to conduct cactus ferruginous pygmy-owl (pygmy-owl) surveys for these projects. We have reviewed the information you provided and have the following comments regarding your request.

A final rule to remove the pygmy-owl from the Endangered Species list was published April 14, 2006, and became effective May 15, 2006. Therefore, the protective regulations of the Endangered Species Act no longer apply to the pygmy-owl. However, upon request, we continue to provide technical assistance related to the conservation of the pygmy-owl.

We agree with the conclusion in your September 25, 2007 correspondence that no suitable pygmy-owl habitat occurs in proximity to the two proposed road projects. Pygmy-owl habitat elements are lacking in these areas due to the extent and intensity of the surrounding land uses. Because of the lack of suitable pygmy-owl habitat, we do not recommend the continuation of pygmy-owl surveys in relation to these projects.

Thank you for the opportunity to provide input on these projects. If you have any questions regarding our comments, or need any additional information, please contact Scott Richardson at 520-670-6150 (x 242) or Sherry Barrett (x 223).

Sincerely,

  
Steven L. Spangle  
Field Supervisor



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# Appendix E

## Articles Regarding Methods to Deter Swallow Nesting



# HPDP Handbook

## Part II, Section D, Subject Guidance: Fish and Wildlife - Appendix #6



### CLIFF SWALLOWS

Terrell P. Salmon  
Extension Wildlife Specialist  
and  
Warner P. Gorenzel  
Research Associate  
Wildlife Extension  
University of California  
Davis, California

#### Damage Prevention and Control Methods

- Nest Removal
  - Wash nests down with a wafer hose or knock down with a pole (permit required)
  - Exclusion
  - Netting and wire, Strip doors
  - Repellents
  - Not effective
  - Toxicants
  - None Registered
  - Trapping
  - Not allowed
  - Shooting
  - Not allowed
  - Frightening Devices
  - Not effective
  - Substrate Modification
  - Slick surfaces discourage nesting
- Architectural Design
  - Some designs discourage nesting

#### Identification

Eight members of the swallow family *Hirundinidae* breed in North America and the Great Plains states: the tree swallow (*Tachycineta bicolor*), violet green swallow (*Tachycineta thalassina*), purple martin (*Progne subis*), bank swallow (*Riparia riparia*), northern rough-winged swallow (*Stelgidopteryx serripennis*), barn swallow (*Hirundo rustica*), cave swallow (*Hirundo fulva*), and the cliff swallow (*Hirundo pyrrhonota*). Of the eight species, only barn and cliff swallows regularly build mud nests attached to buildings and other structures, a habit that sometimes puts them into conflict with man. This is particularly true of the cliff swallow, which nests in use of alternate sites include: (1) deterioration of old nests and nesting substrate, (2) nest use by house sparrows, and (3) buildup of nest ectoparasite levels. Ectoparasites can significantly increase deaths of cliff swallow nestlings. **Nest Construction**

Cliff swallow nests are gourd-shaped, enclosed structures built of mud pellets. They consist primarily of sand with smaller amounts of silt and clay. The nest chamber is lined sparingly with grasses, hair and feathers. In contrast, barn swallow nests are cup-shaped and the pellets contain coarse organic matter such as grass stems, horse hairs and feathers. The nest cup is profusely

lined with grasses and feathers, especially white feathers. The cliff swallows nest chamber is globular and extends forward into an entrance tunnel which opens downward. The tunnel may be absent from some nests. Nest dimensions vary from 5.5 to 10.5 in. (14 to 27 cm) in length and 5.5 to 8.5 in. (14 to 22 cm) basal width, and the opening averages 1.75 in. (4.4 cm) in diameter. The nest is cemented with mud under the eave of a building, bridge or other vertical surface. On structures, the first nests usually are located at the highest point possible, with subsequent nests attached below it, forming a dense cluster. Both sexes construct nests, proceeding slowly to allow the mud to dry and harden. Depending on mud supply and weather, nest construction takes 1 to 2 weeks. Mud is collected at ponds, puddles, ditches and other sites up to half a mile (0.8 km) away with many swallows participating at the same mud source. A typical nest contains 900 to 1400 pellets, each representing 1 trip to and from the nest. Mud-gathering and nest construction are social activities; even unmated swallows will start nests. Mated swallows may build more than one nest per season, even though not all will be used. Therefore, a count of nests under construction will not give an accurate estimate of the number of breeding swallows. **Egg Laying** Egg laying usually begins before the entrance tunnel is completed. Each day one egg is laid until the clutch of 3 or 4 eggs is completed. Clutch size ranges from 2 to 6 eggs. In Texas, egg laying may begin as early as late March to early April, while in North Dakota nesting may not start until early to mid-June. Within a large colony, the date of egg laying varies due to the staggered arrival dates of the swallows. For small colonies, laying may be more synchronous. **Nest Failures** Re-nesting will occur if nests or eggs are destroyed. Nests may fall because they were built too rapidly or may crumble because of prolonged humid weather or rain. House sparrows sometimes usurp empty swallow nests and may also drive off swallows from new nests. A cliff swallow nest taken over by house sparrows is identified by the abundant nest lining (grasses, weeds, feathers and litter) protruding from the entrance. **Hatching** Both sexes incubate the eggs. Incubation begins the day before the last egg is laid and ranges in length from 11 to 16 days. Most studies typically report 14 or 15 days incubation. Whitewash on the lower rim of the nest entrance is a sign of newly hatched nestlings inside the nest. This marking occurs when adults remove fecal sacs from the nest and later when nestlings defecate from the nest entrance. **Fledging and Post-Nesting Period** The nestlings fledge 20 to 25 days after hatching. The juvenile swallows appear similar to adults but are dullish colored and have less sharply defined color patterns. The fledglings will return to the nest 2 or 3 days to be fed before leaving it permanently. Within a week, juveniles will join feeding flocks and leave the colony. There is some dispute concerning the number of broods produced each year. Most observers agree that at least some cliff swallows raise two broods in any one breeding season. Second broods are documented from Virginia and West Virginia, and suggested from Texas and Pennsylvania. On the other hand, one researcher suggested second broods were uncommon in central California and believed that late nests were made by swallows re-nesting after a first failure or by birds that were just late nesters. The time required from start of nest building to departure after raising a brood is 46 to 63 days: 7 to 14 days nest building, 3 to 6 days egg laying, 14 to 15 days incubation, 20 to 25 days to fledging, and 2 or 3 days to leave the nest. Reports of colony occupancy ranging from 110 to 132 days indicate ample time for two broods. A study in California reported that all broods of late nesting cliff swallows died and few second nests were successful. The study further suggested there is only a narrow span of time during which broods are reared. After leaving the nesting colony, cliff swallows may remain in the general area for several weeks. By late summer there is a general southward movement, and by the end of September few swallows remain, except in Texas where a few linger into late October. Fall migration of cliff swallows is not well documented. **Damage** Cliff swallows nest in colonies and often live in close association with man. Most cliff swallow colonies on buildings and other structures are innocuous. In some situations, however, they can become a nuisance, primarily because of the droppings they deposit. In such instances, they may interfere with man's activities by creating aesthetic problems, fouling machinery, and causing health hazards by contaminating foodstuffs. Their mud nests eventually fall to the ground and can cause similar problems. Cliff swallows are host to hematophagous (blood-sucking) arthropods including ticks, fleas, and various other insects including the swallow bur (*Oeciacus vicarius*). Man and his domestic animals may be threatened at various times by these ectoparasites, although they are not the usual hosts. In addition, cliff swallow nests are often used by house sparrows (*Passer domesticus*), introducing another avian pest with its attendant aesthetic damage and potential health hazards. Barn swallows nesting singly in small groups on a structure can cause similar problems but of a lesser magnitude due to the smaller numbers present. **Legal Status** In the United States, all swallows are classified under the Migratory Bird Treaty Act of 1918 as migratory insectivorous birds and are protected. The Treaty arose from a Convention between the United States and Great Britain concerning protection of migratory birds in Canada and the United States. Similar agreements have been signed by the United States with Mexico in 1936, Japan in 1972, and the U.S.S.R. in 1978. In the United States swallows are also protected by state regulations. Under the articles of the Convention, it is illegal for any person to take, possess, transport, sell or purchase swallows or their parts, such as feathers, nests or eggs, without a permit. As a result, certain

activities affecting swallows are subject to legal restrictions. **Permit Requirements** Regardless of the time of year, a depredation permit issued by the Fish and Wildlife Service is required before swallow nests can be removed. This includes nests under construction, completed nests and nests abandoned after the breeding season. It is a common misconception that nests may be removed without a permit after the swallows complete nesting and depart. During nesting, permits authorizing nest removal are issued only if strong compelling reasons exist. Some examples are safety and health hazards posed by a nesting colony located over a doorway/entrance, near loading areas at warehouses and food-processing centers, or at airports where aircraft safety is impaired. During the nonbreeding season and before nests are completed at the start of nesting, the justification required to issue a permit for nest removal need not be as strong as during breeding. In such instances, aesthetics or a past history of problems and the expectation of future problems are sufficient reasons for a permit to be issued. A permit application may be obtained by contacting the U.S. Fish and Wildlife Service. The permit is usually valid for one nesting season only and is free of charge. The permit authorizes the permittee to use specified methods to remove nests. The permittee is required to record the number of nests removed and to report these removals within ten days after the permit expires. Timing is critical. It may take one to two weeks to obtain a permit. If a problem is expected, it is not advisable to wait until nest building begins before applying for a permit, since swallows build their nests and lay eggs in a short time. If eggs or young are in the nest, a permit probably will not be issued. **Damage Prevention and Control Methods Nest Removal** The method or nest removal will be specified by the permit. Usually nests may be washed down with a water hose or knocked down with a pole. Swallows are strongly attracted to old nests or to the remnants of deteriorated nests, so all traces of mud should be removed. Removing nests by these methods is a messy and time-consuming process and may cause dispersal of nest parasites and water damage to the building. As builders or mud nests, cliff swallows have evolved with nest failures from rain or moisture. Washing down nests is nothing more than an artificial rainstorm. Therefore, during nest building, nest removal will require many days because the swallows will persistently rebuild nests. Persistence is undoubtedly affected by the physiological condition of the swallows, past nesting history at the site, and the availability of alternate sites. The swallows usually return the following year, and unless additional control measures are implemented, the whole process must be repeated. **Exclusion** Exclusion refers to any control method that denies physical access to the nest site area. Exclusion represents a relatively permanent, long-term solution to the problem. A permit is not required for this method if it is applied before the swallows arrive or after they have left for the winter. If swallows are nesting and have eggs or young, exclusion may not be used without a permit. Plastic net or poultry wire can provide a physical barrier between the swallows and the nest site. The mesh size should be 1/2 to 3/4 in. (1.3 to 1.9 cm); however, 1 in. (2.5 cm) has been used successfully. If plastic net is used, it should be attached so that it is taut. This reduces flapping in the wind, which looks unsightly and results in tangles or breakage at mounting points. Do not use mist net or any other thin, flexible net with loose pockets or wrinkles that could trap or entangle swallows. Net or poultry wire should be attached to buildings before the swallows arrive and may be left up permanently or removed after the nesting season. Attachment methods may vary according to site requirements and the degree of permanence desired. Net can be attached directly, using tape, staples, trash bag ties, or plastic fasteners. A more elaborate method uses hooks, such as brass cup hooks, mounted on the eaves and the side of the building. An advantage of hooks is that the net can be taken down easily during the nonbreeding period or for maintenance of light fixtures, painting, etc. If hooks or staples are used, they should be rust-resistant to avoid unsightly rust stains on the building. For net, a supporting framework of wooden dowels, wood laths or even metal rods along the edges can ease attachment to the hooks and create a more equal tension on the net (Figure 2). Net may also be stapled to or wrapped once or twice around a wood laths and nailed directly to the structure. On a concrete or cement structure, a power-activated tool, sometimes called a stud gun, can be used to nail the wood lath. The net or wire should extend from the outer edge of the eave down to the sides of the building so the protection from the elements given by the eaves is lost to the swallows (Figures 2, 3). No openings should remain where swallows might enter. Hanging a curtain of netting from the eave is reported effective (Figure 3). The curtain should be 3 to 4 in. (7.6 to 10 cm) from the wall and extend down from the eave 18 in. (46 cm) or more. Cliff swallows occasionally enter buildings through doors or other open entryways and nest inside on the rafters. In some instance simply closing the entrance or blocking it with net or wire is practical and effective. At one site, cliff swallows abandoned nests inside barn lofts when entrance ways were partially closed. At warehouses and other buildings with frequent pedestrian or equipment passage, opening a close entrance way may be bothersome and impractical. In these situations strip doors of vinyl plastic may be installed (Figure 4). Primarily used to control temperature in refrigerated areas, strip doors are approximately 8 in. (20 cm) wide strips of vinyl hung like a curtain. Strips overlap about 3 in. (8 cm). Strip doors do not require opening and closing like a conventional door and are not damaged by passage of equipment. The use of net hung as a curtain to block an entrance is recommended only where there is no possibility of its being caught and ripped by equipment.

Weighting the bottom of the net will help keep it reasonably taut and in position during windy weather. Usually, swallows will not fly into a net or other obstruction, but will stop and hover in front of it. If only that section of a building where swallows have nested is netted, the swallows will often choose alternative sites on the same structure. Therefore, any part of a building suitable for nesting must be netted. **Repellents** Chemical roost repellents (e.g. sticky pastes, sprays) have not been proven effective. Unless a suitable nesting site is almost entirely covered with repellent, cliff swallows will still be able to land, gain a foothold, and begin nest construction. A sticky repellent may actually be counter-productive by improving nest adherence. Cliff swallow nests built over a sticky repellent have been observed. **Toxicants, Trapping and Shooting** There are no chemical toxicants currently registered by EPA for swallow control; and shooting, trapping or harming swallows is not permitted. Since state pesticide registrations vary, check with your local Extension Service office for information on toxicants (if any) and repellents. **Frightening Devices** Hawk, owl, or snake models, noise-makers, and revolving lights have shown little, if any, success or are unproven against cliff swallows. As evidenced by colonies on buildings, cliff swallows are relatively tolerant of human activity and other disturbances. **Substrate Modifications** Modification of the nest substrate has proven effective. Swallows prefer surfaces that provide a good foothold and nest attachment. Removal of the rough surface of a wall and/or overhang makes a site less attractive. This may be accomplished in various ways. Fiberglass panels installed between the eave and wall to form a smooth, concave surface make nest attachment difficult (Figure 3). A smooth surface is also created by a curtain of aluminum foil or plastic tarp draped from a wire strung along the junction of the wall and roof overhang. Other smooth-surfaced materials to deter nesting include glass and sheet metal. A fresh coat of paint that dries to a slick surface is sometimes cited as effective. However, with regard to fresh paint, any of a number of plausible reasons could result in the failure of cliff swallows to reoccupy a colony. The fact that cliff swallows do not occupy a newly painted site does not prove the method effective. On rough surfaces, painting is of doubtful value because it does nothing to alter the basic rough texture of the surface. Painting may be effective on smoother surfaces, but this technique has not been thoroughly tested. Metal projections are sharp, needle-like wire devices generally installed on building ledges and window sills to discourage pigeons and starlings from roosting. Although adaptable to mounting and use under eaves, metal spines have not been widely used for swallow control (Figure 3). In one instance, cliff swallows learned to land on the metal spines and eventually built nests attached to them. **Architecture** Although all the factors that constitute a suitable colony site are not yet understood or documented, architectural design does influence colony site suitability. Buildings with overhanging eaves at acute to right angles with the wall are potential nest sites. Conversely, sites where the overhang and wall meet at an obtuse angle or are rounded and concave are rarely used. The width of the overhang may be important to site suitability, although the point at which this becomes critical is unknown. Few colonies are observed with an overhang of less than 6 to 8 in. (15 to 20 cm). Texture is a factor; wood, stucco, masonry and concrete surfaces are favorable substrates. Metal as a substrate is rarely used, a statement supported by observation of road bridges. Nests on a metal surface are usually located at a crotch or joint where the swallow can gain a foothold. In situations where construction is planned and cliff swallows are present on a nearby structure, consideration to materials and design may eliminate future problems. Cliff swallows may move to nearby structures if control is applied at an existing colony. **Economics of Damage and Control**

Costs of damage are difficult to quantify and vary with the particular site and the method of control employed. The cost of actual or potential damage can range from the intangible nuisance factor of swallows on a house to thousands of dollars from swallows contaminating foodstuffs at a processing center or posing a danger to aircraft at an airport. Similarly, the cost of control varies greatly. Where hosing is used, costs are primarily labor-related and may be minimal. Net is relatively inexpensive (approximately \$35/1000 sq. ft. 1982 prices) and is reported to be effective for 3 to 5 years before replacement. But labor and other equipment costs can be quite high. For example, mounting net on a concrete versus a wooden structure, or 100 ft versus 10 ft above a ground can drastically increase costs. Costs for each site must be judged on an individual basis.

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Questions and Comments regarding this HPDP Web site can be directed to:

[ppgu@dot.state.mn.us](mailto:ppgu@dot.state.mn.us)

Revised: June 13, 2005



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## Appendix F

### Project Area Photographs



Photo 1 – Southeast corner of the La Cholla Boulevard and Ruthrauff Road intersection, view to the north.



Photo 2 – Northeast corner of the La Cholla Boulevard and Ruthrauff Road intersection, view to the south.



Photo 3 – La Cholla Boulevard and Curtis Road intersection, view to the east.



Photo 4 – La Cholla Boulevard and Curtis Road intersection, view to the southeast.



Photo 5 – Circle K Store at the southwest corner of West River Road and North La Cholla Boulevard, view to the northwest.



Photo 6 – Southeast corner of West River Road and La Cholla Boulevard, view to the northeast.



Photo 7 – La Cholla Boulevard, bridge over the Rillito River, view to the southwest.



Photo 8 – Rillito River at La Cholla Boulevard, view to the east.



Photo 9 –La Cholla Boulevard, view looking north from the south end of the project area.



Photo 10 – The vacant lot at the northwest corner of La Cholla Boulevard and Curtis Road.