APPENDIX B

COMMON WILDLIFE SPECIES IN ARAVAIPA CREEK

APPENDIX B. COMMON WILDLIFE SPECIES IN ARAVAIPA CREEK

BIRDS

Great Blue Heron	*Ardea herodias*
Mallard	*Anas platyrhynchos*
Gadwall	*Anas strepera*
American Wigeon	*Anas americana*
Green-winged Teal	*Anas crecca*
Cinnamon Teal	*Anas cyanoptera*
Turkey Vulture	*Cathartes aura*
Cooper's Hawk	*Accipiter cooperii*
Northern Harrier	*Circus cyaneus*
Harris' Hawk	*Parabuteo unicinctus*
Red-tailed Hawk	*Buteo jamaicensis*
American Kestrel	*Falco sparverius*
Gambel's Quail	*Callipepla gambelii*
Killdeer	*Charadrius vociferus*
Spotted Sandpiper	*Actitis macularia*
Least Sandpiper	*Calidris minutilla*
White-winged Dove	*Zenaida asiatica*
Mourning Dove	*Zenaida macroura*
Greater Roadrunner	*Geococcyx californianus*
Great Horned Owl	*Bubo virginianus*
Barn Owl	*Tyto alba*
Western Screech Owl	*Otus kennicottii*
Lesser Nighthawk	*Chordeiles acutipennis*
Anna's Hummingbird	*Calypte anna*
Black-chinned Hummingbird	*Archilochus alexandri*
Northern Flicker	*Colaptes auratus*
Gila Woodpecker	*Melanerpes uropygialis*
Ladder-backed Woodpecker	*Picoides scalaris*
Vermilion Flycatcher	*Pyrocephalus rubinus*
Western Kingbird	*Tyrannus verticalis*
Black Phoebe	*Sayornis nigricans*
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Common Raven	*Corvus corax*
Verdin	*Auriparus flaviceps*
Bewick's Wren	*Thryomanes bewickii*
Cactus Wren	*Campylorhynchus brunneicapillus*
Northern Mockingbird	*Mimus polyglottos*
Black-tailed Gnatcatcher	*Polioptila melanura*
Ruby-crowned Kinglet	*Regulus calendula*

BIRDS (Cont.)

Phainopepla	*Phainopepla nitens*
Loggerhead Shrike	*Lanius ludovicianus*
European Starling	*Sturnus vulgaris*
Bell's Vireo	*Vireo bellii*
Yellow-rumped Warbler	*Dendroica coronata*
Brown-headed Cowbird	*Molothrus ater*
Hooded Oriole	*Icterus cucullatus*
Bullock's Oriole	*Icterus bullockii*
Summer Tanager	*Piranga rubra*
Northern Cardinal	*Cardinalis cardinalis*
Pyrrhuloxia	*Cardinalis sinuatus*
Blue Grosbeak	*Guiraca caerulea*
Black-headed Grosbeak	*Pheucticus melanocephalus*
House Finch	*Carpodacus mexicanus*
Lesser Goldfinch	*Carduelis psaltria*
Abert's Towhee	*Pipilo aberti*
White-crowned Sparrow	*Zonotrichia leucophrys*
Lincoln's Sparrow	*Melospiza lincolnii*
Song Sparrow	*Melospiza melodia*

MAMMALS

Coyote	*Canis latrans*
Gray Fox	*Urocyon cinereoargenteus*
Raccoon	*Procyon lotor*
Striped Skunk	*Mephitis mephitis*
Cactus Mouse	*Peromyscus eremicus*
Deer Mouse	*Peromyscus maniculatus*
Southern Grasshopper Mouse	*Onychomys torridus*
White-throated Woodrat	*Neotoma albigula*
Arizona Cotton Rat	*Sigmodon arizonae*
Arizona Pocket Mouse	*Pergonathus amplus*
Desert Cottontail	*Sylvilagus audubonii*
Black-tailed Jackrabbit	*Lepus californicus*
Western Pipistrelle	*Pipistrellus hesperus*
Big Brown Bat	*Eptesicus fuscus*
Cave Myotis	*Myotis velifer*
Mexican free-tail bat	*Tadarida brasiliensis*
Pallid bat	*Antrozous pallidus*

AMPHIBIANS

Tree Frog	*Hyla arenicoler*
Sonoran Desert Toad	*Bufo alvarius*
Great Plains Toad	*Bufo cognatus*
Western Spadefoot Toad	*Scaphiopus hammondi*
Lowland Leopard Frog	*Rana yavapaiensis*
Chiricahua Leopard Frog	*Rana chiricahuaensis*
Bullfrog	*Rana catesbiana*

REPTILES

Sonora Mud Turtle	*Kinosternon sonoriense*
Spiny Softshell	*Trionyx spiniferus*
Banded Gecko	*Coleonyx variegatus*
Lesser Earless Lizard	*Holbrookia maculata*
Greater Earless Lizard	*Holbrookia texana*
Long-tailed Brush Lizard	*Urosaurus graciosus*
Tree Lizard	*Urosaurus ornatus*
Side-blotched Lizard	*Uta stansburiana*
Regal Horned Lizard	*Phrynosoma solare*
Western Whiptail	*Cnemidophorus tigris*
Coachwhip	*Masticophis flagellum*
Sonora Gopher Snake	*Pituophis melonaleucus*
Common Kingsnake	*Lampropeltis getulus*
Checkered Garter Snake	*Thamnophis marcianus*
Black-necked Garter Snake	*Thamnophis cyrtopsis*
Western Diamondback Rattlesnake	*Crotalus atrox*

FISH

Spikdace	*Meda fulgida*
Loach Minnow	*Tiaroga cobitis*
Roundtail Chub	*Gila robusta*
Desert Sucker	*Catostomus clarki*
Sonora Sucker	*Catostomus insignis*
Speckled Dace	*Rhinichthys osculus*
Longfin Dace	*Agosia chrysogaster*
Carp	*Cyprinus carpio*
Red Shiner	*Notropis lutrensis*
Channel Catfish	*Ictalurus punctatus*
Largemouth Bass	*Micropterus salmoides*
Green Sunfish	*Chaenobryttus cyanellus*
Blue Tilapia	*Tilapia aurea*
Yellow Bullhead	*Ameiurus natalus*
Mosquitofish	*Gambusia affinis*

APPENDIX C

COMMON PLANT SPECIES IN ARAVAIPA CREEK

APPENDIX C. COMMON PLANT SPECIES IN ARAVAIPA CREEK

Common Name	Scientific name
Red Brome	*Bromus rubens*
Bermuda Grass	*Cynodon dactylon*
Century Plant	*Agave chrysantha*
Desert Spoon	*Dasylirion wheeleri*
Fremont Cottonwood	*Populus fremonti*
Gooding Willow	*Salix goodingii*
Arizona Walnut	*Juglans major*
Desert Hackberry	*Celtis pallida*
Net-leaf Hackberry	*Celtis reticulata*
Arizona Sycamore	*Plantanus wrightii*
Water-cress	*Rorippa nasturtium-aquaticum*
Four-wing Saltbush	*Atriplex canescens*
White-thorn Acacia	*Acacia constricta*
Desert Senna	*Cassia covesii*
Blue Paloverde	*Cercidium floridum*
Little-leaf Paloverde	*Cerdicium microphyllum*
Heron-bill	*Erodium cicutarium*
Creosotebush	*Larea divaricata*
Western Soapberry	*Sapindos sapanaria*
Graythorn	*Zizyphus obtusifolia*
Canyon Grape	*Vitis arizonica*
Saltcedar	*Tamarix ramosissima*
Hedgehog	*Echinocereus* Spp
Pincushion	*Mammillaria* Spp
Buckhorn Cholla	*Opuntia acanthocarpa*
Ocotillo	*Fouquieria splendens*
Velvet Ash	*Fraxinus pennsylvanica*
Sacred Datura	*Datura meteloides*
Wolfberry	*Lycium pallidum*
Tree Tobacco	*Nicotiana glauca*
Water Speedwell	*Veronica anagallis-aquatica*
Buttonbush	*Cephalanthus occidentalis*
Canyon Ragweed	*Ambrosia ambrosioides*
Triangle-leaf bursage	*Ambrosia deltoidea*
Desert Broom	*Baccharis sarothroides*
Seepwillow	*Baccharis salicifolia*
Desert Marigold	*Baileya multiradiata*
Brittlebush	*Encelia farinosa*
Burroweed	*Haplopappus tenuisectus*
Burobrush	*Hymenoclea monogyra*
Cocklebur	*Xanthium strumarium*

APPENDIX D

SPECIAL STATUS SPECIES

APPENDIX D. SPECIAL STATUS SPECIES

Lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) - The lesser long-nosed bat (formerly Sanborn's long-nosed bat) is one of three leaf-nosed bats in Arizona (Hoffmeister 1986). This species was listed as endangered on September 30, 1988 (Federal Register Vol. 53 No. 190). The current range of the lesser long-nosed bat extends from southern Maricopa County through Pinal, Pima, Cochise, and Santa Cruz Counties and into Mexico.

This species is found mainly in desertscrub habitat dotted with agaves (*Agave* sp.), mesquite, creosotebush (*Larrea tridentata*), and columnar cacti. Daytime and maternity roosts are located in caves and abandoned mines. The bats feed on nectar and pollen from saguaros and agaves forming a mutualistic relationship with these plants (FWS 1991). They cannot tolerate prolonged exposure to cold, do not hibernate and spend winters in Mexico.

The project area is surrounded by Sonoran Desertscrub habitat which includes saguaros. It is most likely utilized by lesser long-nosed bats on a transient basis. The closest roosting colonies to the project area are in the Santa Catalina, Galiuro and Pinaleno Mountains with the closest site being over 30 miles away (Sabra Schwartz, AGFD, personal communication, 13 March 1998).

Bald Eagle (*Haliaeetus leucocephalus*) - In 1978 all bald eagles in 43 of the 48 contiguous United States, including Arizona, were classified as endangered (43 FR 6233, February 14, 1978), and those in Minnesota, Wisconsin, Michigan, Oregon, and Washington were classified as threatened. On July 12, 1995, the bald eagle was downlisted to threatened in all 48 States (Fed Register Vol 60, No. 133, page 36000-36010).

In Arizona, the number of known bald eagle nesting areas has steadily increased from 1 or 2 in 1970, to 38 in 1998. This increase may have resulted from the establishment of new territories as well as from increased nest search efforts.

There have been no recorded bald eagle nests in the project area. The nearest nest is located approximately 20 miles north of the project area, near the confluence of the San Pedro and Gila Rivers. The Winkelman nest territory was first active in 1995 but no nesting was attempted. In 1996, 2 eggs were laid but failed to hatch. The nest also failed in 1997 and has been classified as unoccupied in 1998.

Yuma clapper rail (*Rallus longirostrus yumanensis*) - The Yuma clapper rail is a chicken-shaped marsh bird with a long, down-curved beak. This subspecies is found along the Colorado River from Needles, California, to the Gulf, at the Salton Sea and other localities in the Imperial Valley, California, along the Gila River from Yuma to at least Tacna, Arizona, and several areas in central Arizona, including Picacho Reservoir (Todd 1986; Rosenberg et al. 1991).

Yuma clapper rails are found in emergent wetland vegetation such as dense or moderately dense stands of cattails (*Typha latifolia* and *T. domingensis*) and bulrush (*Scirpus californicus*) (Eddleman 1989; Todd 1986). They can also occur, in lesser numbers, in sparse cattail-bulrush stands or in dense reed (*Phragmites australis*) stands (Rosenberg et al. 1991). The most productive clapper rail areas consist of a mosaic of uneven-aged marsh vegetation interspersed with open water of variable depths (Conway et al. 1993). Annual fluctuation in water depth and residual marsh vegetation are important factors in determining habitat use by Yuma clapper rails (Eddleman 1989).

The nearest population of clapper rails is located at Picacho Reservoir, approximately 40 miles west of the project area (Sabra Schwartz, AGFD, personal communication, 13 March 1998).

Peregrine falcon (*Falco peregrinus anatum*) - The historic breeding range for the peregrine falcon extended from Canada and Alaska south into Baja, California, central Mexican highlands and northwest Mexico, including continental United States (U.S.) with the exception of the southeast part of the country. In Arizona, both resident and migrant peregrine falcons are found over the entire state.

Peregrine falcons in the southwest inhabit cliffs and river gorges near water. Eyries occur on cliffs which generally exceed 61 m in height. Eyries are situated on open ledges and a preference for a southern exposure increases with latitude (FWS 1984). There are approximately 188 breeding pairs of peregrine falcons in Arizona (Sabra Schwartz, AGFD, personal communication, March 13, 1997).

The peregrine falcon (*Falco peregrinus anatum*), occurs in the project area on a transient basis. The closest nesting population is approximately 20 miles to the east in Aravaipa Canyon (Sabra Schwartz, AGFD, personal communication, 13 March 1998).

Cactus ferruginous pygmy-owl (*Glaucidium brasiliarum cactorum*) - The subspecies of cactus ferruginous pygmy-owl (pygmy-owl) which is found in Arizona was listed as endangered on March 10, 1997 (Vol 62, No. 46, 10730-10747).

Little is known of this species' life history in Arizona. The pygmy-owl is similar in appearance to its congener, the northern pygmy-owl, which is also found in the State. This small (17 cm) owl can be distinguished from other small owls in the State by its long tail and round earless head. It can be identified from the similar northern pygmy-owl by the dark versus light barring in the tail. However, the best criteria for identification is its call.

Historically, the species was more common and widespread in the State. Records have shown this species utilized cottonwoods (*Populus fremontii*) and willows (*Salix goodingii*) for nesting in riparian woodlands (Rea 1983). Records prior to 1971 indicate this species was found as far north in the State as the Blue Point Cottonwoods near the confluence of the Salt and Verde Rivers (Millsap and Johnson 1988). Today confirmed reports of pygmy-owls in Arizona are

exclusively from Sonoran desertscrub below 3000 ft (914 m) in elevation and south of Picacho Peak (AGFD 1996). The habitat contains foothill paloverde (*Cercidium microphyllum*) and saguaro cacti (*Cereus giganteus*) in large numbers, but it is the presence of medium and large ironwood trees (*Olnea tesota*) in varying densities that predominate all detection areas (AGFD 1996).

No record for pygmy-owl (*Glaucidium brasilianum cactorum*) is known for the site. The last verified sightings on the lower San Pedro River were in 1985 and 1986 at Dudleyville, Arizona where two birds were seen each year (Sabra Schwartz, AGFD, personal communication, 13 March 1998). The closest nesting population is in northwest Tucson, 40 air miles away. Reclamation conducted surveys for the cactus ferruginous pygmy-owl (according to AGFD protocol) on evening of May 20 and the morning of May 21, 1998. No pygmy-owls response was elicited.

Southwestern willow flycatcher (*Empidonax extimus traillii*) - The southwestern willow flycatcher was listed as endangered in Federal Register Vol. 60, No. 38, February 27, 1995 (FWS 1995). The southwestern willow flycatcher is difficult to distinguish from other members of the genus *Empidonax*. Identification is more easily verified by its call, a sneezy "fitz-bew."

The southwestern willow flycatcher is one of four subspecies of the willow flycatcher most commonly recognized in North America (Tibbitts et al. 1994). The four subspecies have subtle differences in color and morphology and occupy distinct breeding ranges. The breeding range of *E. t. extimus* includes southern California, Arizona, New Mexico, the extreme southern portions of Nevada, Utah, and western Texas.

No southwestern willow flycatcher surveys have been conducted on Aravaipa Creek due to lack of suitable habitat (Muiznieks et al. 1994, Sferra et al. 1995, Spencer et al 1996, Sferra et al. 1997, and AGFD in press). The closest breeding territories occur on the San Pedro River near the confluence with Aravaipa Creek. In 1998, additional flycatcher territories have been located immediately upstream of the confluence on the San Pedro River.

Chiricahua leopard frog (*Rana chiricahuensis*) - The Chiricahua leopard frog, *Rana chiricahuensis*, described in 1979 by Platz and Mecham (1979), had already suffered serious reduction in geographic range in Arizona by 1987 (Clarkson and Rorabaugh 1989). The species was afforded Candidate status under the Endangered Species Act listing process in 1996 (FR 61(40):7600). The Chiricahua leopard frog was reported from both the headwaters (23 km northeast of Bonita) and lower reach (9 km east of Highway 77) of Aravaipa Creek by Frost and Platz (1983), while Platz and Frost (1984) reported the lowland leopard frog (*R. yavapaiensis*)

from the same lower site. There are more recent records of lowland leopard frog from upper Aravaipa Creek (M. Sredl, AGFD, personal communication, June 10, 1998), but no sightings of *R. chiricahuensis* have been recorded along the stream since the records of Frost and Platz (1983).

Reclamation conducted surveys for the Chiricahua leopard frog in the project area on the evening of May 20, 1998. No leopard frogs of any species or life stage were definitely encountered during the survey. *Bufo* spp. were seen and captured (eggs, larvae, and metamorphs), as were adult canyon tree frogs, (*Hyla arenicolor*).

Gila topminnow (*Poeciliopsis occidentalis occidentalis*) - The species Sonora topminnow *Poeciliopsis occidentalis* includes two subspecies: Gila topminnow *P. o. occidentalis*, distributed in the Gila River Basin of Arizona and New Mexico and the Ríos Gila, Concepción, and Sonora basins of Sonora, Mexico; and Yaquí topminnow *P. o. sonoriensis*, distributed in the Río Yaquí Basin of northern Mexico and extreme southeastern Arizona. Both of these poeciliids (livebearers) were listed as federally endangered in 1967 without designation of critical habitat. Gila topminnow was formerly distributed widely throughout lower (<4920 ft) elevations in the Gila River Basin among springs, streams, and marshes, but populations continue to dwindle (Bagley et al. 1991, Hendrickson and Brooks 1991). Loss of habitat due to declining water tables, arroyo cutting, and introduction of nonnative fishes, especially mosquitofish *Gambusia affinis*, are primary reasons for its decline (Meffe et al. 1983, Stefferud 1984, Marsh and Minckley 1990).

Today, less than a dozen natural populations of Gila topminnow remain in Arizona, with most occurring within the Santa Cruz River Basin (Stefferud 1984, Brown and Abarca 1992). The two historic collection localities in the San Pedro River Basin (San Pedro River 4 mi N of Feldman, artesian spring 8 mi SE of Mammoth) no longer support populations of Gila topminnow. Extensive repatriation efforts have been undertaken in Arizona since the 1960s, but relatively few have had long-term success (Bagley 1991, Hendrickson and Brooks 1991). Three attempts to stock Gila topminnow into Aravaipa Creek (two in 1967 and one in 1977) failed (David Weedman, Arizona Game and Fish Department, personal communication).

Loach minnow *(Tiaroga cobitis)* - Loach minnow is a small, short-lived fish endemic to streams of the Gila River Basin. The species has been extirpated from most of its historic range, surviving as a relatively large population only in Aravaipa Creek (Minckley 1981). In Arizona, smaller populations inhabit the East Fork Black River (Marsh 1997), Blue River, Campbell Blue River, White River, San Francisco River, and Eagle Creek. In New Mexico, loach minnow is found along portions of the Gila, Tularosa, and San Francisco rivers, and in Dry Blue Creek (USFWS 1990a). Loach minnow was listed as threatened on October 28, 1986 (Federal Register Vol. 51 No. 208).

Loach minnow is a current-loving species, inhabiting interstices of gravel and rubble in shallow, well-defined, stream riffles (USFWS 1990a), similar to the habits of darters in the Mississippi River drainage. In Aravaipa Creek, loach minnow is consistently rare compared to most other species (Minckley 1981). Numbers are greatest within the gorge area, and it is infrequently collected below that reach (Minckley 1981). Apparently summer water temperatures in the lowermost canyon preclude year-round habitation by this species there (W.L. Minckley, Arizona State University, personal communication). Foods in Aravaipa Creek were predominantly ephemeropteran nymphs and black fly (Family Simuliidae) larvae (Schrieber and Minckley 1981).

Spikedace *(Meda fulgida)* - Spikedace is another small-bodied, short-lived fish endemic to the Gila River Basin that has been extirpated from most of its historic range. In Arizona, spikedace remains only in Aravaipa Creek, a portion of the upper Verde River, and in Eagle Creek, and also inhabits the upper Gila River in New Mexico (USFWS 1990b). Spikedace was listed as threatened on July 1, 1986 (Federal Register Vol. 51 No. 126).

Spikedace occupies flowing pools generally less than a meter deep over sand, gravel, or mud bottoms below riffles or in eddies (Minckley 1981). Foods in Aravaipa Creek are primarily ephemeropteran nymphs and dipteran larvae, but substantial numbers of winged adults of these groups and caddis flies are taken (Schrieber and Minckley 1982). Spikedace is more frequently encountered in the lower canyon of Aravaipa Creek than loach minnow, and standing crops are relatively high there compared to above the gorge (Minckley 1981).

Desert Tortoise (*Gopherus agassizii*) - The desert tortoise is a long-lived terrestrial reptile that inhabits desert regions in the southwestern U.S. The Sonoran population is isolated from the Mojave population by the Colorado River. Arizona's Sonoran population of desert tortoise occurs discontinuously south and east of the Colorado River, from Lake Mead National Recreation Area through the southwestern, west-central, and south-central parts of the State. The precise range limits are generally not well known, and there are frequent information gaps within the known or suspected limits (Barrett and Johnson 1990).

The desert tortoise occupies a variety of habitats throughout its range. In Arizona's Sonoran desert, the desert tortoise typically occurs in the paloverde-cacti-mixed scrub series (Barrett 1990). Rangewide, the desert tortoise is typically found at elevations of 300 m to 1067 m. In Arizona, it has been found as low as 158 m (Mohave Valley, Mohave County) and as high as 1615 m (east slope of the Santa Catalina Mountains, Pima County) (Barrett and Johnson 1990).

Sonoran desert tortoise sheltersites (dens, pallets, etc.,) are usually found on rocky bajadas and slopes, or in washes that dissect the desertscrub. Tortoises will use more than one den and reuse previously occupied dens (Barrett and Johnson 1990). They appear to avoid the deep, fine-soiled valley situations favored by the Mohave desert tortoise.

There is no habitat for this species in the immediate project area. Potential habitat is located

upslope on the bajadas.

Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*) - In Arizona, the western yellow-billed cuckoo is an uncommon to fairly common breeder in riparian habitats, primarily below the Mogollon Rim in the Colorado and Gila River drainages (Phillips et al. 1964). The largest concentrations are in the Upper Santa Cruz, San Pedro, Verde, Bill Williams and Gila River drainages of central and southeastern Arizona (Krueper, in press).

A riparian obligate species found in highest occurrences and density on cottonwood/willow associations Yellow-billed cuckoos require a minimum of 10 hectares (ha) of broad-leafed forest at least 100 m wide (Gaines 1974) and at least 1 ha of dense nesting habitat per pair (Laymon and Halterman 1989). Marginal habitat is described as "a minimum of 4 ha of broad-leafed forest at least 50 m wide, and at least 0.5 ha of dense nesting habitat" (Laymon and Halterman 1989). Multiple pairs of cuckoos can be found in wider strips (>100 m wide and > 265 ha patches) of habitat versus narrow strips, where pairs are distributed more widely (Laymon, personal communication).

The project area does not provide suitable habitat for the western yellow-billed cuckoo.

Greater western mastiff bat (*Eumops perotis californicus*) - The greater western mastiff bat belongs to the Mollossidae family (free-tailed bats) (AGFD 1992). It is one of only six North American species of *Eumops*, of which only two species are found in Arizona (AGFD 1992). The greater western mastiff bat is the largest bat in the U.S.

In Arizona, the greater western mastiff bat is considered a year round resident based on collections or calls heard in every month except January. Unlike other species, the greater western mastiff bat makes a distinctive, piercing, high pitched "cheep" every 2 to 3 seconds during flight. The call is louder than that of any other U.S. bat and, unlike other bats, it is emitted almost continuously while flying (AGFD 1992).

Greater western mastiff bats roost in crevices and shallow caves on the sides of cliffs and rock walls (Hoffmeister 1986). The habitat is primarily lower and upper Sonoran desertscrub (AGFD 1992). They need a roost site with a vertical drop of 3 m or more because their large body size and narrow wings make ground launching difficult (AGFD 1992). These bats prefer to crowd into tight crevices 0.3 m or more deep and 5 cm or more wide (AGFD 1992). They will roost singly or in groups of two, but usually in colonies of up to
100 individuals (AGFD 1992). Threats to this species include disturbances at roost sites (AGFD 1992).

There is no roosting habitat for this species in the project area.

Mexican garter snake (*Thamnophis eques*) - Mexican garter snake is a large (up to 39 inches), highly aquatic species tied to the presence of perennial water, and is found in riparian and marsh

habitats in east-central and southeastern Arizona and southward to Oaxaca, Mexico. Its known distribution includes the upper San Pedro River drainage, but it is unknown if the species inhabits the lower drainage and Aravaipa Creek. The species has generally disappeared from lowland habitats in Arizona (Stebbins 1985). Nonnative species introductions, especially bullfrog *Rana catesbeiana* and predatory fishes, have negatively impacted this species (Rosen and Schwalbe 1988). Cattle overgrazing also has impacted habitats of Mexican garter snake through elimination of ground cover. The species has been extirpated from several localities since 1950, and has completely disappeared from the Tucson area, where it formerly had been abundant (Rosen and Schwalbe 1988).

Mexican garter snakes feed primarily on fishes and amphibians, and supplement their diet with mice and lizards (Rosen and Schwalbe 1988). Young are born alive in early June to early July. Although body and clutch sizes of Mexican garter snake are relatively large for garter snakes, reproduction apparently occurs only once every two years, and reproductive output is therefore low (Rosen and Schwalbe 1988). Long adult lifespan and apparent low juvenile survivorship are other life history features of this species.

Lowland leopard frog (*Rana yavapaiensis*) - Lowland leopard frog is one of the several species of leopard frog described from Arizona in recent decades that has escaped widespread population losses from the interior of Arizona, although it has been lost from the lower Colorado River, Arizona-California, and Imperial County, California (Clarkson and Rorabaugh 1987). Introduction of bullfrogs and nonnative predatory fishes is the most serious known threat, and invasion of the nonnative Rio Grande leopard frog is cause for concern to some populations (Platz et al. 1990). Specific causes of recent declines of this and other amphibian species in Arizona and elsewhere are largely undetermined.

Lowland leopard frog is distinguished from Chiricahua leopard frog by a mottled network of dark blotches on the rear thighs (Chiricahua leopard frog has white spots) and smaller body proportions. Populations may hybridize with Chiricahua leopard frog where ranges overlap (Stebbins 1985). Platz and Frost (1984) reported lowland leopard frog from lower Aravaipa Creek, and there are more recent records of lowland leopard frog from upper Aravaipa Creek (M. Sredl, AGFD, personal communication, June 10, 1998).

Roundtail chub (*Gila robusta*) - Roundtail chub was historically widespread in larger streams and rivers and their tributaries in the Colorado River Basin. In the Gila River Basin, it is now largely found only in smaller, less impacted, tributary streams. The subspecies in Aravaipa Creek has been designated as *G. r. grahami*, one of four subspecific forms variously recognized within the species complex (Minckley 1973). The species inhabits pools and eddies and the relatively swift waters below rapids. Roundtail chub can readily be caught on hook and line, and is classified as a sport fish in Arizona.
In Aravaipa Creek, roundtail chub consumes larger invertebrates, small lizards, and other fishes, occupying the position of "top carnivore" when large (Minckley 1973, Schrieber and Minckley 1981). It is highly secretive, mostly inhabiting deeper pools as adults (Minckley 1973). Chubs

have been shown to move long distances in Aravaipa Creek, possibly a response to seasonal temperature changes (Siebert 1980, Williams 1991). Relatively little information on other aspects of its life history is known.

Mexican garter snake is a large, highly aquatic species found in riparian and marsh habitats in east-central and southeastern Arizona and southward to Oaxaca, Mexico. Its distribution includes the San Pedro River drainage, but it is unknown if the species inhabits Aravaipa Creek. Nonnative species introductions, especially bullfrog, have negatively impacted this species through predation (Rosen and Schwalbe 1988), and the species has been extirpated from several localities since 1950. Mexican garter snakes feed primarily on fishes and amphibians, and bear live young in early June to early July.

Townsend's big-eared bat (*Plecotus townsendii*) - Townsend's big-eard bat is one of only 5 species in the genus (*Plecotus*); three species occur in the U.S. and only one in Arizona. Within Arizona, Townsend's big-eared bat has a widespread distribution, but is not common anywere and is least common in northeastern grasslands and southwestern desert areas (AGFD 1992).

Townsends big-eared bats utilize caves and mine tunnels during the day but often rest in abonadoned buildings at night (Hoffmeister 1986). They prefer to hang from open ceilings at roost sites and do not use cracks or crevices (AGFD 1992). At maternity roosts thesse bats prefer dim light near the edge of the lighted zone (AGFD 1992). Townsend's big-eared bats can be found from low elevation desertscrub to coniferous forests (Hoffmeister 1986). Wintering habitat is in cold caves and mines in the upper elevations, from the Grand Canyon to southeastern Arizona.

Although general populations trends indicate that population losses are occurring, no specific therets were identified (AGFD 1992).

There are no caves to provide night roosts in the immediate project area.

Western red bat (*Lasiursu borealis*) - The western red bat is a summer resident of Arizona (AGFD 1992). The preferred habitat is riparian and oter wooded areas where they roost in trees by day. They are often found in fruit orchards but also roost in saguaro boots and occasionally in cave-like situations (E.L. Cockrum, personal communication *in* AGFD 1992). Although they generally avoid caves and buildings during both summer and winter. Western red bats range from 2400 to 7200 feet in elevation. They have been found upstream on Aravaipa Creek on The Nature Conservancy property (AGFD 1992).

There is limited but potential habitat in the project area. The few trees removed would not be expected to adversely impact this species.

Mesquite Mouse (*Peromyscus merriami*) - The mesquite mouse, like name implies, is restricted to mesquite bosques (forests). They are found in south central Arizona (Hoffmeister 1986). Little information has been recorded for this species. The demise of most of the major mesquite bosques in southern Arizona has most likely significantly impacted this species (Hoffmeister 1986).

Although there is a remnant mesquite bosque in the project area it is unknown whether the mesquite mouse would be present. It apears that the project area may actually be just outside of the range for this species.

APPENDIX E

PREHISTORIC AND HISTORIC HABITATION

APPENDIX E. PREHISTORIC AND HISTORIC HABITATION

Archaeological data on the occupation of the lower San Pedro Valley by Paleo-Indian big-game hunters and Archaic hunters and gatherers is limited, and as a consequence not much is known about these early inhabitants. Significantly more data are available on the Hohokam. Primarily farmers, the Hohokam established villages along the lower San Pedro River beginning around the 5th century A.D. Villages were often located near the mouths of major tributary drainages because these locations offered the Hohokam not only fertile floodplain areas for farming, but two riparian systems that could be exploited for their plant and animal resources (Masse 1980:210). During the next several centuries, Hohokam occupation along the lower San Pedro and its tributaries continued and even expanded. Large and small villages grew in number to accommodate a growing population. Some of the large major villages contained one or more ballcourts that served as gathering places for rituals and games for people from surrounding smaller sites. The smaller sites were often situated on terraces and were associated rock piles, check dams, and other water control and water harvesting features necessary for dry farming (Masse 1980.216).

Beginning in the 13th century A.D., what archaeologists call the Classic Period began. Lasting until around A.D. 1400, the Classic period along the lower San Pedro Valley is associated with immigration of Indian groups from plateau and mountain areas to the north and east. Whereas the Preclassic period is noted for its ballcourts, the Classic period in southern Arizona is associated with platform mounds and surface structures of adobe and cobbles enclosed by walls (these walled villages are known as compounds). Recent survey along the San Pedro River (Doelle 1990a; 1990b; 1995) identified several platform mound and compound village sites. Platform mounds were probably used for ritual observation, and platform mound sites are often located at regular intervals along the river as if identifying distinct boundaries (Doelle 1995:2). Farming continued to be the primary subsistence pursuit of the Classic period occupants of the lower San Pedro Valley.

Between A.D. 1400 and 1500, the Classic period ended for reasons that remain unclear to archaeologists. Native populations along the lower San Pedro (and throughout most of southern Arizona) declined, and settlement patterns shifted into fewer and smaller villages. When the first Spanish explorers ventured into southern Arizona and down the San Pedro River, groups of native farmers resided in a string of villages located along the river. These villages lacked the platform mounds, compounds, and adobe and stone masonry architecture that marked the Classic period. These farmers, known as the Sobaipuri, apparently were well established in southern Arizona when the Spanish arrived in the mid-16th century A.D. (Masse 1981:28). Archaeological data for the Sobaipuri is limited and somewhat confusing. Sites definitely identified as Sobaipuri are few, and the limited archaeological data conflict with the documentary evidence provided by the Jesuit priest Eusebio Francisco Kino and other Spanish explores in the

17th and 18th centuries (Masse 1981:28,44). According to Spanish reports, the Sobaipuri were successful irrigation farmers who lived in oval, brush-covered structures along the San Pedro and Santa Cruz rivers. Limited archaeological data suggest they were primarily hunter-gatherers, with farming playing a minor subsistence role (Masse 1981:44).

Regardless, Spanish documents indicate that beginning in the latter part of the 17th century Sobaipuri living on the San Pedro River were being pushed west into the Santa Cruz River Basin by Apache raiders. By 1762 Apache raids had effectively forced the Sobaipuri to abandon the San Pedro River basin (Masse 1981:28-30).

The Apache arrived in the southwest sometime in the late 15th and early 16th centuries and are related to Athapaskan groups in Alaska, Canada, and Northern California (Bronitsky and Merritt 1986:257). The lower San Pedro River and surrounding area to the east was occupied by the Aravaipa band of the San Carlos group of Western Apache, who controlled the area until eventually forced onto a reservation by the American army in the late 1800s.

The Apache were farmers, who also moved frequently in search of game and wild plant foods. When they eventually acquired the horse from the Spanish, raiding also became an important subsistence pursuit. Apache settlement (for example, the lack of permanent architecture) and subsistence practices have contributed to the absence of archaeological visibility of Apache sites. Because archaeologists have had trouble identifying Apache sites, archaeological data are limited (Bronitsky and Merritt 1986:258).

Indian Trust Allotment 013736, also historically known as the Chiquito Allotment, has a long well-documented history of Apache tribal cultural affiliation and an incredibly sad history. In 1871 Chief Eskiminzin and his band of 150 Aravaipa (Creek) Apaches lived around the outer limits of the Camp Grant Military Reservation, just two miles downstream from this allotment, near the confluence of Aravaipa Creek with the San Pedro River. To avenge the death of four Anglos reportedly at the hands of Indians, in April that year, a mob of angry whites from Tucson entered the Indian settlement near Camp Grant and murdered 118 of the band. Only a handful of the Aravaipa Apaches managed to escape with their lives and none of their possessions save what they wore. Eventually, out of dire necessity, they gravitated back to their homeland base. Their descendants, 12 in number, applied for and received 800 acres of trust allotments along Aravaipa Creek and the San Pedro River and upon which they reestablished themselves, cultivated garden tracts by gravity diversions of their own labors and managed to remain relatively self sufficient by their diligence and to eke out an existence there. The vigilantes never were convicted in a court of law in Arizona Territory. In time, history proved the Aravaipa Apaches were innocent victims in this thirst-for-revenge case of "mistaken identity."

In the entire state of Arizona 7,846 patents for trust Indian allotments, aggregating 179,868 acres were granted by the Federal Government. Chiquito's Allotment is one of the most extraordinary and rarist of all Arizona Indian allotments, for it is one of but 18 which possessed and still possesses a perennial stream upon it, from which gravity water was diverted by Indian

occupant owners for agricultural subsistence gardens. It was the presence of perennial water upon and within these several allotments that was and yet is so vital as a trust asset of the Indian owners, and the principal reason for the selection of these lands initially and subsequently again by the Indian owners as trust allotments.