Biological Assessment

Stateline Road

Greenlee County

FEMA-1586-DR-AZ, PW #171

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FEMA

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TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

APPENDIX

1.0 INTRODUCTION

This Biological Assessment (BA) was prepared pursuant to Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 USC §§ 1531 *et seq*.), to address the impacts of the action to federally-listed and proposed species and, where applicable, their designated critical habitat. The Federal Emergency Management Agency (FEMA) proposes to provide funding through the Arizona Division of Emergency Management (ADEM) to Greenlee County (the County) for repairs to Stateline Road. The repairs are necessary to restore facilities damaged as the result of the February 2005 winter storms, designated as FEMA-1586-DR-AZ. FEMA proposes to provide these funds through the Public Assistance Program pursuant to Section 406 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act), Public Law 93-288, as amended, and its implementing regulations found at Title 44 of the Code of Federal Regulations (44 CFR) Part 206.

During February 2005 winter storms, floodwaters of the Gila River damaged Stateline Road and the adjacent bank protection facilities, which are located in unincorporated Greenlee County adjacent to the Arizona and New Mexico border (Figure 1). Greenlee County maintains Stateline Road for the benefit of the local irrigation district, the local utility company, the public, and local property owners. The proposed action would involve re-aligning Stateline Road and installing new bank protection along the southern bank of the Gila River.

The development of this BA is intended to fulfill the compliance requirements of pertinent environmental laws, regulations, and policies in accordance with the requirements of Section 7(b) of the ESA of 1973, as amended, and implementing regulations [19 USC 1536 (c), 50 CFR 402.12 (f) and 402.14 (c)], and ESA guidance contained in the *Endangered Species Consultation Handbook* (USFWS and National Marine Fisheries Service 1998). The primary objectives of this BA are to: (1) provide a conceptual framework of the background and need for the action; (2) describe the proposed action; (3) provide detailed information on the natural history of federally-listed species potentially occurring in the vicinity of the action; (4) evaluate the potential effects of the proposed action on these species; (5) provide a determination of effect ("beneficial," "no effect," "not likely to adversely affect," or "likely to adversely affect") for the listed and proposed species; and (6) describe any measures that could be implemented to reduce the extent of effect, to reduce incidental take associated with the proposed action, or to promote conservation and recovery of listed species pursuant to Section 7(a)(1) of the ESA.

2.0 DESCRIPTION OF THE ACTION

Stateline Road is located in unincorporated Greenlee County along the Arizona and New Mexico border, approximately 2 miles east of the Town of Franklin, Greenlee County, Arizona (Township 8 South, Range 32 East, Section 34; and Township 9 South, Range 32 East, Section 3) (Figure 1). The area is depicted on the Duncan U.S. Geological Survey 7.5-minute quadrangle. The proposed action would re-align Stateline Road and install bank protection along the south bank of the Gila River for the length of the proposed re-alignment of Stateline Road.

Greenlee County maintains Stateline Road for the benefit of the local irrigation district, the local utility company, the public, and local property owners. Stateline Road is the primary route for vehicles accessing agricultural pump stations in the area. In addition, the roadway is the primary means of access to utility lines adjacent to Stateline Road. Traffic on Stateline Road consists of local residents, farm vehicles, utility line workers, and county employees.

The February 2005 winter storms caused floodwaters of the Gila River to erode and wash away approximately 8 million cubic feet of land (500 ft x 800 ft by 20 ft) at the proposed action site. This damage included approximately 1,300 linear feet of Stateline Road and approximately 500 linear feet of river bank and bank protection facilities along the pre-storm southern bank of the Gila River. The bank and road protection facilities destroyed in the flood included a wall constructed of 60-foot-long railroad rails, which were driven in place, and enclosed with flat bed railroad cars placed on end (Photo 1). Damage to the Gila River bank protection facilities has rendered land on the southern bank of the Gila River, including the remaining segments of Stateline Road, more susceptible to erosion from future floodwaters. In addition, flood damage had made passage on Stateline Road impossible; thus, eliminating access to irrigation pumps, utility lines, and agricultural fields. Therefore, action is needed to rebuild Stateline Road and reduce the future flood hazard.

The purpose of the proposed action is to re-align Stateline Road and install new bank protection along the southern bank of the Gila River. New bank protection would prevent damage to Stateline Road, agricultural fields, and irrigation pumps, while the re-aligned roadway would restore access to these facilities.

The proposed action would consist of re-aligning the destroyed stretch of Stateline Road and the installation of bank protection facilities (Figure 2). The re-aligned Stateline Road would be approximately 1,300 feet in length and 20 feet in width, adjacent to the southern bank of the Gila River. As with the remaining existing segments of Stateline Road, this new road segment would

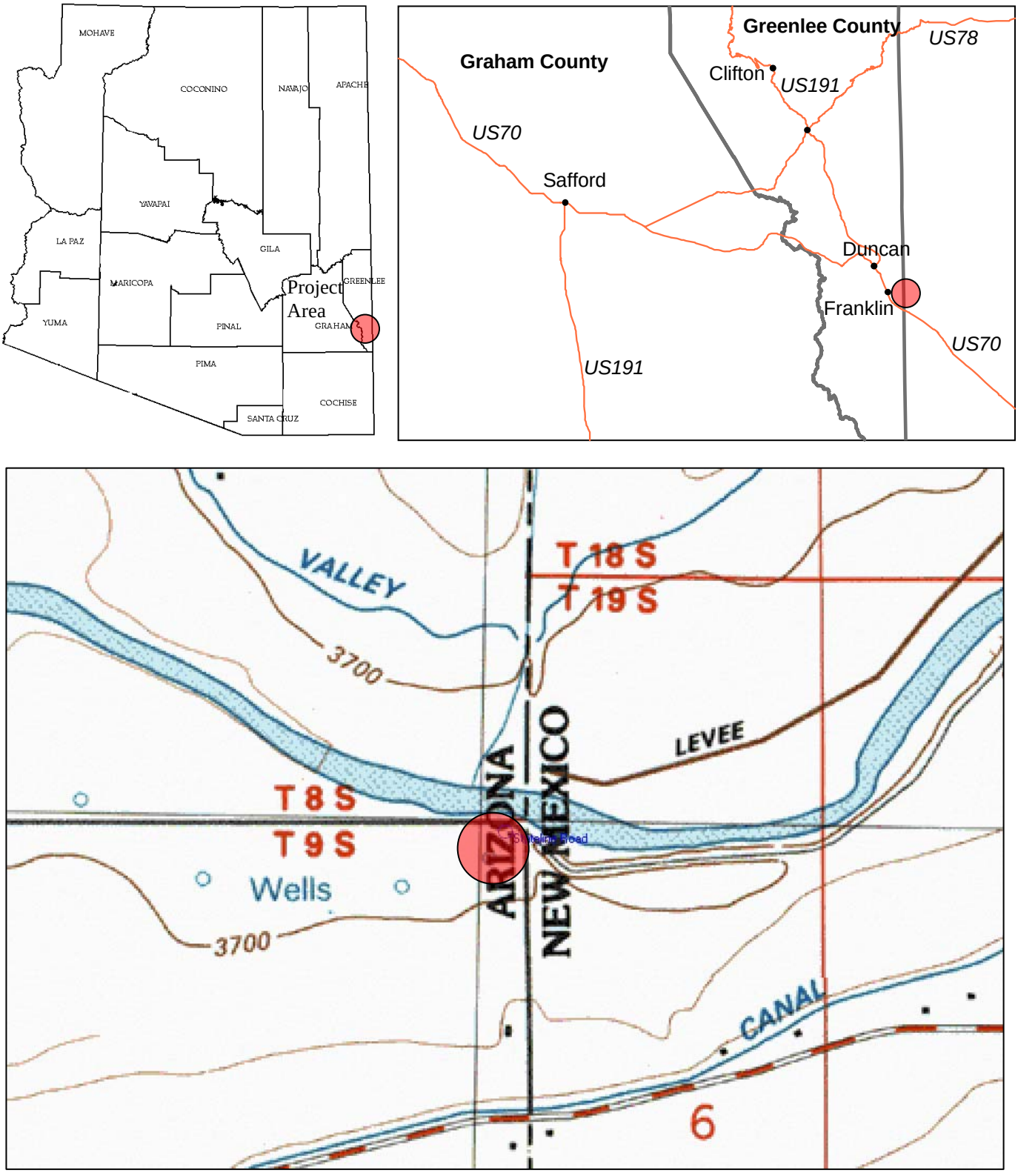

Figure 1. Stateline Road General Project Location

Township 8 South, Range 32 East, Section 3
Township 9 South, Range 32 East, Section 34
Duncan Quadrangle

● Project Area

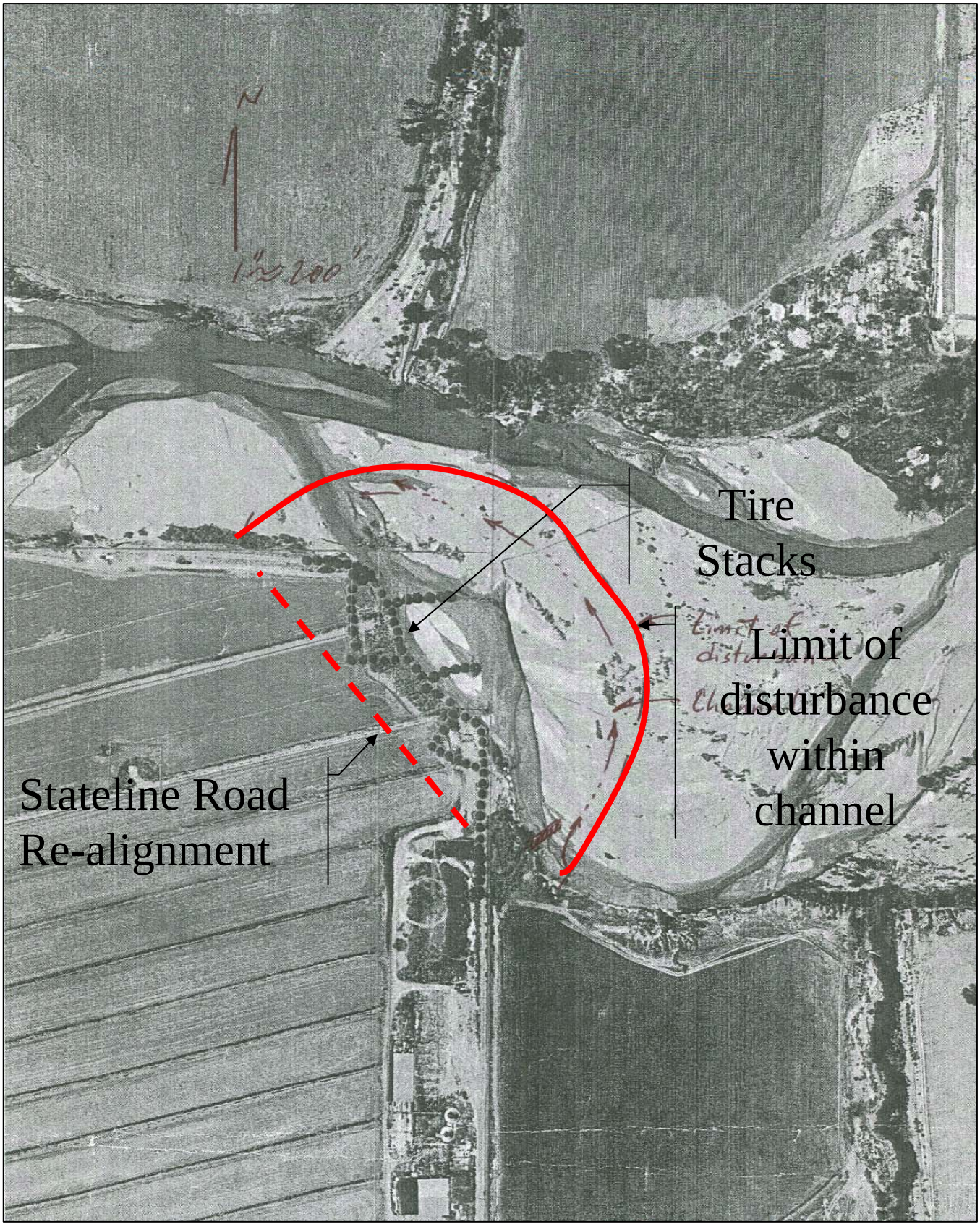

Figure 2. Stateline Road Action Area

be constructed of dirt and gravel. Bank protection would be placed on the south bank of the Gila River adjacent to the re-aligned Stateline Road. The construction of the bank protection facilities would consist of the installation of stacks of large cement-filled tires, which would mostly be buried and held in place with rail steel and cables. Approximately 75 tire stacks would be installed. Total height of each stack would be 12 to 14 feet. Tires would be half filled with concrete with a 12-inch sleeve in the middle. The number of tires in each stack would vary, but should general number three tires per stack. Rail steel would be driven into the ground through the sleeve. Each stack of tires and steel would be tied to adjacent stacks using steel cable. Most of the tire stacks would be buried behind the existing riverbank. Engineering fabric would be placed between tire stacks and the backside bank away from the river. Excavated areas created to install the tire stacks would be backfilled with native soil and leveled. Some of the tires that would be exposed would be exposed on the bank facing the river.

Photo 1. The bank and road protection facilities destroyed in the flood (wall constructed of 60-foot-long railroad rails, driven in place, and enclosed with flat bed railroad cars placed on end).

At two locations, tires would be placed into the river in single rows that would roughly be perpendicular to the adjacent riverbank. For each row, the tire stack furthest from the riverbank would be installed at or below the river bottom. Each stack closer to the riverbank would have more material exposed above the river bottom. The final profile of each row would slope into the river with successively more of the tire stack buried below the river bottom. Approximately 700 linear feet of bank protection is proposed. The tires would be provided by Phelps Dodge Mining Company and would consist of used tires from mine haul vehicles.

Construction of Stateline Road and the bank protection facility would involve excavation and grading of soil. Equipment to be used would include a wheel tire loader (Cat 950), bulldozers, excavators, backhoes, a dump truck, an equipment service truck, pickups, and a flatbed trailer. Access to the action site would be from Stateline Road. Equipment and materials would be stored at staging areas located on adjacent agriculture fields owned by local property owners. Staging would occur on previously disturbed soils. Erosion protection measures during construction would consist of placing silt fencing and straw-bails perpendicular to the slope and contours. Native vegetation at the construction site (mesquite trees, acacia trees, grasses, and thistle) would be removed. Following construction, the construction site would be seeded with shrubs and grasses native to the area. In addition, the County would plant cottonwood and willow cuttings at strategic locations to assist in soil stabilization. Construction of both action components is estimated to take 90 days and should be performed between April and mid-June to avoid peak flows in the Gila River.

Debris associated with any illegal dump sites found within the project area would be removed and placed in an appropriate waste disposal facility.

3.0 ENVIRONMENTAL SETTING

The action area is within the Basin and Range physiographic province, a landscape characterized by numerous mountain ranges that rise abruptly from broad, plain-like valleys or basins. In Arizona, these mountain ranges and associated basins generally trend north-south or northwest-southeast. Relatively recent episodes of continental rifting, volcanism, erosion, and sedimentation dominate this region, and a combination of processes gradually filled the basins with sediments from adjacent mountain ranges (USFS 1994). Erosion cycles are now dissecting these deposits and modifying the rift valley through transport and deposition processes. Several types of landforms exist in the Basin and Range province, each covering about an equal area. They are: 1) plains with low mountains, 2) plains with high hills, 3) open high hills, and 4) tablelands (USFS 1994). The Stateline Road action area is specifically in the Duncan Valley Basin, which is an elongated valley surrounded by the Peloncillo Mountains to the west and the Big Lue Mountains to the east (ADWR 2005). Elevations in this basin range from about 6,571 to 3,336 feet. As is typical in the Basin and Range province, ephemeral streams in each valley connect to a through-flowing river, which in this case is the Gila River. Flow rates in these rivers are low to moderate, except during periods of heavy rain, when large amounts of surface runoff can occur.

Land use in the action area is predominately agricultural. A number of canals, including the Model and Sunset Valley Canals distribute water from the Gila River to agriculture fields in the Duncan Valley. The Town of Duncan, population 800, is located approximately three miles downstream (northwest) of the action area.

The soils in the action area consist of silty clay loams typical of the Gila River Valley (NRCS Web Soil Survey). These soils have a moderate to high susceptibility to sheet and rill erosion by water; however, the soils have low to moderate runoff rates due to the action area's low grade, which mitigates this susceptibility somewhat (NRCS Web Soil Survey). The soils are currently subject to occasional flooding from the Gila River during prolonged, heavy rainfall.

A U.S. Department of the Interior (DOI), Bureau of Reclamation study on the geomorphology of the Upper Gila River Basin found that the Gila River has migrated within the Pima Soil Boundary (i.e., the Gila River floodplain that is comprised of the Pima silty clay loam soil type) for the last several hundred years (DOI 2004). Within this boundary, areas of young alluvium are particularly prone to erosion because they are part of the active channel migration zone that often sees lateral river movement (DOI 2004). The majority of erosion occurs during high flow events (DOI 2004).

The soils under Gila River itself are made up of alluvial materials up to several thousand feet thick. Beneath this are finer-grained substances with locally-concentrated salt deposits (ADWR 2005).

The primary drainage feature in the action area is the Gila River. Headwaters of the Gila River originate in the highlands of the Gila Mountains and flow in a general westerly direction through Arizona to its confluence with the Colorado River near Yuma, Arizona. Flooding in the Gila River basin is caused primarily by rains from fall and winter storm systems. Extreme flood-producing storms are widespread and generally cover the majority of the Upper Gila River basin. Instantaneous peak discharge data confirm that the largest-magnitude floods occur in the fall and winter and are predominately from rainfall. (DOI 2004)

There are five long-term gaging stations located on the Gila River and the San Francisco River, a tributary of the Gila. A DOI study (2004) concluded that mean daily flows at these five sites are typically less than about 1,000 cubic feet per second (cfs), and are always higher in the November – April winter season than during the July – October season. Peak discharge probability estimates indicate that at these sites the 2-year flood ranges between 5,210 cfs and 9,650 cfs and the 100-year flood ranges between 44,800 cfs and 175,000 cfs (USGS 2006). The nearest U.S. Geological Service gaging station was on the Gila River at the Arizona-New Mexico state line. This gage was operated from 1939-1949, during which the river was intermittent, with peak flows typically in spring and late summer. A peak flow of 58,700 cfs occurred on December 18, 1978. Typical flows rarely exceeded 500 cfs. A gaging station at Duncan, Arizona has been in operation since 2003. On February 13, 2005 this gage read a peak flow of 38,900 cfs (USGS 2006). Floodwaters from this event damaged Stateline Road.

In the early 1800's the Gila River in eastern Arizona was described as running between banks covered with tall cottonwoods and willows. This bottom land extended back a mile on each side. Severe flooding during 1904-1917 scoured out essentially all of the riparian vegetation and widened the channel considerably in the Safford Valley (Arizona State University 1979); similar changes probably occurred in the action area at this time. Other channel widening events occurred in 1941 and 1965-1967, coincident with major floods. However, by the early 1970s, the channel width had decreased dramatically and aggraded in the Safford Valley compared to 1904-1917 period (Turner 1974).

The Upper Gila River Watershed covers about 6,000 square miles with elevation changes from 2,600 feet to 11,000 feet above sea level. Because there are locally-concentrated salt deposits below the Gila River's alluvial layer, natural subsurface flow through the aquifer system transmits salts. This increases salinity in the river's water column, leading to concerns about

salinity levels for water users in the watershed. However, groundwater quality is in general good with dissolved solids concentrations ranging from about 100 to 2,150 milligrams per liter. Additionally, no significant changes in groundwater levels have been observed. (ADWR 2005)

The surface water in the Upper Gila River can be characterized as very hard, slightly alkaline but of good water quality. A 2000 Arizona Department of Environmental Quality (ADEQ) study on water quality in the Upper Gila River Basin found that only 0.51% of the samples taken during the course of their study were acute exceedances of water quality standards. Of these samples, seven were for turbidity and eleven were for dissolved oxygen. (ADEQ 2000)

Based on site reconnaissance of the action area and review of the National Wetland Inventory maps, no evidence of wetlands was found in the action area. There is a Freshwater Emergent Wetland, code PEM1C, listed in the National Wetland Inventory upstream of the action area across the New Mexico border approximately 400 feet to the southeast.

Vegetation in the Duncan Valley is classified as Chihuahuan Desertscrub in upland areas, and Riparian Woodland and Riparian Scrub along streams and rivers (Brown 1994). Both creosote bush (*Larrea tridentata*) and tarbush (*Flourensia cernua*) are the most prevalent upland vegetation. Other species include mariola (*Parthenium incanum*) and whitethorn acacia (*Acacia neovernicosa*). Honey mesquite (*Prosopis glandulosa*) is usually abundant in sandy areas along washes or fringing the edges of playas. Often, if the area has been grazed, Snakeweed (*Xanthocephalum sarothrae*) may be dominant. The presence of snakeweed is a good indicator of land disturbance, and its dominance suggests a history of grazing or agricultural use. Similary associated with disturbed areas is Russian thistle (*Salsola kali*). Occasionally present are yucca, particularly soaptree yucca (*Yucca elata*), a Mormon tea (*Ephedra* sp.), and two species of *Opuntia*, either a prickly pear or a cholla. Up to thirty species of annuals and perennial forbs are known from Chihuahuan Desertscrub. Among the forbs, desert marigold (*Baileya multitradiata*) is conspicuous. Other forbs include desert zinnia (*Zinnia arerosa*), little golden zinnia (*Zinnia grandiflora*), fluffgrass (*Erioneuron pulchellum*), desert holly (*Perezia nana*), and buffalo gourd (*Cucurbita foetidissima*).

Riparian Woodlands are largely restricted to the riverbeds and adjacent terraced banks of perennial or spring-flowing streams, where they are maintained by periodic winter-spring flooding. Two vegetation associations are generally related with Riparian Woodland: cottonwood/willow association and mesquite bosque. Cottonwood/willow forests are found along the first terrace of a river, which is the area encompassing the normal flood excursions of the river. On the first terrace, commonly occurring trees such as Fremont cottonwood (*Populus fremontii*) and Goodding willow (*Salix gooddingii*) grow close to the water. Farther back on the

terrace, where the soil is saturated, is a band of arrow weed (*Pluchea sericea*). Even further back is a zone containing screwbean (*Prosopis pubescens*) and quail bush (*Atriplex lentiformis*). Mesquite bosques occur on the second terrace of a riparian system. The second terrace is that area one to eight feet above the first terrace that is covered only by extreme floods. In addition to mesquite (*Prosopis* sp.), other common species include desert willow (*Chilopsis linearis*), seep willow (*Baccharis glutinosa*), desert broom (*Bacccharis sarathroides*), and acacia (*Acacia* sp.). Tamarisk (*Tamariz* sp.) is common in both associations. Riparian Scrub is associated with dry ephemeral washes. Vegetation is characterized by plant species found in adjacent desertscrub habitat, such as mesquite and acacia, although riparian plants are typically larger and often occur at higher densities than those in upland areas. Plants in this association grow in rows along the margins of the watercourses and are clearly set apart from the intervening vegetation of the uplands. Other species present include desert willow, seep willow, desert broom, and tamarisk.

Riparian habitats support greater wildlife diversity and abundance than most other community types. Approximately 20 percent of bird species are confined to riparian settings; another sixty percent can live in, and are frequently found in riparian environments. In the Chihuahuan Desert, bats are most often associated with free-standing water. Large mammals find refuge in riparian bosques. The population densities of medium-sized and large mammals are greatest in riparian systems.

Vegetation in the action area has been disturbed by floodwaters, agriculture, road construction and maintenance, and utility line installation and maintenance. As a result of these disturbances, the Riparian Woodland or Riparian Scrub that may have been prevalent at one time is no longer present. Vegetation in the action area now consists primarily of tamarisk, desert broom (*Baccharis sarothroides*), kochia (*Kochia scoparia*), and Russian thistle (Photo 2). Vegetation structural diversity in the action area is low, with shrubs and forbs of 1 to 2 feet in height dominating (Photo 3). The action area does not contain trees or other prevalent riparian plant species.

In the vicinity of the action area, the river forms a channel approximately 1,000 to 1,500 feet in width. The active perennial channel for the Gila River migrates within this channel. Currently, the active perennial channel flows along the north bank of the Gila River in the proximity of the action area. The action area is located on the south bank of the river. Riparian vegetation lines the north bank of the active perennial channel, while the interior of the channel is comprised of gravel and cobbles, and generally lacks vegetation.

Photo 2. Early successional invasion species such as tamarisk and Russian thistle in the action area.

Riparian habitat in the vicinity of the action area is characterized by a patch of willows and cottonwoods. This stringer (approximately 0.2 acres) of mature cottonwoods and willow trees lies on the north bank of the active perennial channel, opposite the action site. This vegetation has an open understory, likely from relatively dry soils conditions (Photo 4).

The floodplain of the Gila River through the action area has been extensively modified by past and present agricultural development. The active perennial channel at Stateline Road lies along the north bank of the river and is incised to a depth of 8-12 feet below the adjacent channel. Groundwater pumping, return flow, agricultural chemicals, and dikes associated with agriculture in the action area have likely affected flow regimes, water quality, and channel morphology.

Photo 3. Low structural diversity of vegetation in action area.

Stateline Road is the primary route for vehicles accessing agricultural pump stations in the area. Traffic consists of personal and farm vehicles (pers. comm. Phillip Ronnerud Greenlee County). The existing action area has been subject to disturbance from dike construction, bank stabilization, agriculture, and flood damage. Irrigation dikes, bank stabilization, and Stateline Road within the action area were destroyed by floodwaters in February 2005. During a visit in February 2006, vehicle tracks were evident on the south bank within the action area.

Photo 4. A stringer of mature cottonwoods and willow trees lies on the north bank of the river, opposite the action site.

4.0 SPECIES EVALUATION AND DESCRIPTION

Information concerning threatened, endangered, or other special status species that may occur in the action area was obtained from the U.S. Fish and Wildlife Service (USFWS) Arizona Ecological Services Field Office website for Greenlee County (Appendix A). In addition, the Arizona Game and Fish Department's (AGFD) Heritage Database Management System (HDMS) was searched for known occurrences of special status species (Appendix B). Literature review was conducted to identify habitat requirements and distribution of special status species. Species that were assessed for presence in the action area are presented in Table 1.

Table 1. Endangered and Threatened Species Listed by the USFWS for Greenlee County, Arizona.

Common Name	Scientific Name	Status
Apache (Arizona) trout	*Oncorhynchus apache*	Threatened without critical habitat
California Brown Pelican	*Pelecanus occidentalis californicus*	Endangered without critical habitat
Chiricahua Leopard Frog	*Rana chiricahuensis*	Threatened without critical habitat
Gila chub	*Gila intermedia*	Endangered with critical habitat
Gila trout	*Oncorhynchus gilae*	Threatened without critical habitat
Lesser Long-nosed Bat	*Leptonycteris curasoae yerbabuenae*	Endangered without critical habitat
Loach Minnow	*Tiaroga cobitis*	Threatened with proposed critical habitat
Mexican Gray Wolf	*Canis lupus baileyi*	Endangered without critical habitat
Mexican Spotted Owl	*Strix occidentalis lucida*	Threatened with critical habitat
Razorback sucker	*Xyrauchen texanus*	Endangered with critical habitat
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Endangered with critical habitat
Spikedace	*Meda fulgida*	Threatened with proposed critical habitat

The potential for occurrence of federally-listed species in the action area was evaluated based on (1) pertinent scientific literature, (2) qualitative comparisons between the known habitat requirements of each species and biotic and abiotic conditions found in the action area, and (3) field surveys conducted by NISTAC biologists, under contract to FEMA.

Of the 12 federally listed species, 10 were eliminated from further evaluation because the action area is either: (1) clearly outside of the known geographic or elevational range of the species, or (2) does not contain habitat characteristics known to support the species. The two federally-listed species that have potential to occur in the action area are the federally endangered razorback sucker (*Xyrauchen texanus*) and the federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*). In addition, critical habitat has been designated in the action area for both species. Federally listed species included in the USFWS lists but excluded from further evaluation are addressed in Table 2 below.

Table 2. Species Excluded from Detailed Evaluation.

Species	Status	Habitat Requirements	Exclusion Justification
Apache (Arizona) trout *Oncorhynchus apache*	Threatened	Species found in Apache, Gila, Graham, Greenlee, and Navajo counties. Restricted to streams in the upper Salt, Gila, Blue, and Little Colorado drainages in the White Mountains. Occurs in small, cold, high-gradient streams above 5,000 feet elevation. These streams have substrates consisting of boulders, rocks, and gravel, with some sand or silt, and flow through mixed conifer forests and mountain meadows (USFWS 2002a).	The action area is below 5,000 feet and it outside the known range of the upper Gila River.
California Brown Pelican *Pelecanus occidentalis californicus*	Endangered	Most Arizona records are along the Colorado River including north to Davis Dam and even to Lake Mead (La Paz and Yuma counties), and Gila Valley (Maricopa, Pinal, Mojave and Gila counties). Coastal land and islands; species found around many Arizona lakes and rivers (USFWS 2001a)	The action area is outside the current known range of the California brown pelican.
Chiricahua Leopard Frog *Rana chiricahuensis*	Threatened	Streams, rivers, backwaters, ponds, and stock tanks that are mostly free from introduced fish, crayfish, and bullfrogs. Require permanent or nearly permanent water sources. (USFWS 2006a)	The action area is outside the current known range of the Chiricahua leopard frogs. Predators including the bullfrog are known to occur in the middle reach of the Gila River.
Gila Chub *Gila intermedia*	Endangered	Pools, springs, cienegas, and streams between 2,000 and 3,500 feet. (USFWS 2006b)	The action area is outside the known range of the Gila chub. There is no critical habitat in the action area (70 FR 66664, November 2, 2005).
Gila Trout	Threatened	Gila trout was extirpated from Arizona around 1900, but has recently been repatriated into Dude Creek (Gila County) in September 1999 and Raspberry Creek (Greenlee County) in November 2000. Found in small, high mountain streams at an elevation of approximately 5,000 to 10,000 feet (USFWS 2006c).	The action area is located below 5,000 feet and is outside the current known range of the Gila trout.
Lesser Long-nosed Bat *Leptonycteris curasoae yerbabuenae*	Endangered	Desert scrub habitat with agave and columnar cacti present as food plants below 6,000 ft. (USFWS 2001b)	The action area does not contain roosting habitat or foraging plants known to be used by lesser long-nosed bat.
Loach Minnow *Tiaroga cobitis*	Threatened	Present populations are geographically isolated and inhabit	The action area is located outside the current known range of the

Table 2. Species Excluded from Detailed Evaluation.

Species	Status	Habitat Requirements	Exclusion Justification
		the upstream ends of their historical range. The species persists in Arizona only in limited reaches in the East Fork of the White River (Navajo County), Aravaipa Creek, Deer Creek, and Turkey Creek (Graham and Pinal counties), San Francisco and Blue rivers and Eagle, Campbell Blue and Little Blue creeks (Greenlee County). Bottom dweller of small to large perennial creeks and rivers, typically in shallow turbulent riffles with cobble substrate, swift currents, and filamentous algae. Found below 8,000 feet elevation (USFWS 2005a).	loach minnow.
Mexican Gray Wolf *Canis lupus baileyi*	Endangered	Reintroduced into the Apache National Forest and adjacent Gila National Forest in western New Mexico. Found in chaparral, woodland, and forested areas between 4,000 and 12,000 ft. May cross desert areas. (USFWS 2004a)	The action area is outside the known range of the Mexican gray wolf.
Mexican Spotted Owl	Threatened	Occurs in varied habitat, consisting of mature montane forest and woodland, shady wooded canyons, and steep canyons. In forested habitat, uneven-aged stands with a high canopy closure, high tree density, and a sloped terrain appear to be key habitat components. They can also be found in mixed conifer and pine-oak vegetation types. Generally nests in older forests of mixed conifer or ponderosa pine/Gambel oak. Nests are found in live trees in natural platforms (e.g., dwarf mistletoe brooms), snags, and on canyon walls. Elevation ranges from 4,100 to 9,000 feet (USFWS 2002b).	The action area is outside the current range of the Mexican spotted owl. In addition, the action area does not contain habitat known to support this species. There is no critical habitat in the action area (69 FR 53182, August 31, 2004).
Spikedace *Meda fulgida*	Threatened	In Arizona, populations are found in the middle Gila River, lower San Pedro River, Aravaipa Creek, Eagle Creek, and the Verde River within Graham, Pinal, Greenlee, and Yavapai counties. Found in	The action area is outside the current range of the spikedace.

Table 2. Species Excluded from Detailed Evaluation.

Species	Status	Habitat Requirements	Exclusion Justification
		moderate to large perennial streams, where it inhabits moderate to fast velocity waters over gravel and rubble substrates. Specific habitat consists of shear zones where rapid flow borders slower flow, areas of sheet flow at the upper ends of mid-channel sand/gravel bars, and eddies at downstream riffle edges. Recurrent flooding helps the spikedace maintain its competitive edge over invading exotic species. Typically occupied streams are found under 6,000 feet in elevation. (USFWS 2005b).	

4.1 Southwestern Willow Flycatcher

Based on the presence of critical habitat in the action area, the southwestern willow flycatcher was identified for detailed evaluation. Life history information, habitat suitability, and impacts determination are provided below.

4.1.1 Life History Information

Description

One of four currently recognized willow flycatcher subspecies, the southwestern willow flycatcher, is a neotropical migratory species that breeds in the southwestern U.S. from approximately April 1 to September 1 and migrates to Mexico, Central America, and possibly northern South America during the non-breeding season (USFWS 1995). The historical range of the southwestern willow flycatcher included southern California, Arizona, New Mexico, western Texas, southwestern Colorado, southern Utah, extreme southern Nevada, and extreme northwestern Mexico (Sonora and Baja) (USFWS 1995).

Listing and Critical Habitat

The southwestern willow flycatcher was listed as endangered, without critical habitat on February 27, 1995 (USFWS 1995). Critical habitat was later designated on July 22, 1997. A correction notice was published in the Federal Register on August 20, 1997 to clarify the lateral extent of the designation. On May 11, 2001, the 10th circuit court of appeals set aside designated

critical habitat in those states under the 10th circuit's jurisdiction (New Mexico). The USFWS decided to set aside critical habitat designated for the southwestern willow flycatcher in all other states (California and Arizona) until it could re-assess the economic analysis.

On October 19, 2005, the USFWS re-designated critical habitat for the southwestern willow flycatcher (USFWS 2005c). A total of 737 river miles across southern California, Arizona, New Mexico, southern Nevada, and southern Utah were included in the final designation. The lateral extent of critical habitat includes areas within the 100-year floodplain. The primary constituent elements of critical habitat include riparian plant species in a successional riverine environment (for nesting, foraging, migration, dispersal, and shelter), specific structure of this vegetation, and insect populations for food. A variety of river features such as broad floodplains, water, saturated soil, hydrologic regimes, elevated groundwater, fine sediments, etc. help develop and maintain these constituent elements (USFWS 2005c).

A final recovery plan for the southwestern willow flycatcher was signed by the USFWS's Region 2 Director on August 30, 2002, and was released to the public (USFWS 2002c). The Plan describes the reasons for endangerment, current status of the flycatcher, addresses important recovery actions, includes detailed issue papers on management issues, and provides recovery goals. Recovery is based on reaching numerical and habitat related goals for each specific Management Unit established throughout the subspecies range and establishing long-term conservation plans (USFWS 2002c).

Reasons for Endangerment

Reasons for decline have been attributed primarily to loss, modification, and fragmentation of riparian breeding habitat, along with a host of other factors including loss of wintering habitat and brood parasitism by the brown-headed cowbird (*Molothrus ater*) (USFWS 1995, USFWS 2005c). Habitat loss and degradation is caused by a variety of factors, including urban, recreational, and agricultural development, water diversion and groundwater pumping, channelization, and livestock grazing. Fire is an increasing threat to willow flycatcher habitat. Fire frequency in riparian vegetation increases with dominance by saltcedar, and water diversions or groundwater pumping results in desiccation of riparian vegetation (USFWS 2005c). Willow flycatcher nests are parasitized by brown-headed cowbirds, which lay their eggs in the host's nest. Feeding sites for cowbirds are enhanced by the presence of livestock and range projects such as waters and corrals; agriculture; urban areas; golf courses; bird feeders; and trash areas. When these feeding areas are in or near flycatcher breeding habitat, especially coupled with habitat fragmentation, cowbird parasitism of flycatcher nests may increase.

Habitat

The southwestern willow flycatcher is a riparian obligate, nesting along rivers, streams, and other wetlands where dense growths of willow (*Salix* sp.), seepwillow (*Baccharis* sp.), buttonbush (*Cephalanthus* sp.), boxelder (*Acer negundo*), saltcedar (*Tamarix chinensis*), or other plants are present, often with a scattered overstory of cottonwood and/or willow. The subspecies breeds in dense riparian habitats from sea level in California to just over 7,000 feet in Arizona and southwestern Colorado. Historic egg/nest collections and species' descriptions throughout its range, describe the southwestern willow flycatcher's widespread use of willow (*Salix* spp.) for nesting (USFWS 1995). Currently, southwestern willow flycatchers primarily use Geyer willow (*Salix geyeriana*), Gooddings willow (*Salix gooddingii*), boxelder (*Acer negundo*), saltcedar, Russian olive (*Elaeagnus angustifolio*), and live oak (*Quercus agrifolia*) for nesting. Other plant species less commonly used for nesting include: buttonbush (*Cephalanthus* sp.), black twinberry (*Lonicera involucrata*), cottonwood (*Populus* spp.), white alder (*Alnus rhombifolia*), blackberry (*Rubus ursinus*), and stinging nettle (*Urtica* spp.). Based on the diversity of plant species composition and complexity of habitat structure, four basic nesting habitat types can be described for the southwestern willow flycatcher: monotypic willow, monotypic exotic, native broadleaf dominated, and mixed native/exotic (USFWS 2005c).

Tamarisk is an important component of the flycatchers’s nesting and foraging habitat in Arizona and other parts of the bird’s range. In 2001 in Arizona, 323 (80 percent) of the 404 known flycatcher nests (in 346 territories) were built in a tamarisk tree (USFWS 2005c). Tamarisk had been believed by some to be a habitat type of lesser quality for the southwestern willow flycatcher, however comparisons of reproductive performance, prey populations, and physiological conditions of flycatchers breeding in native and exotic vegetation has revealed no difference (USFWS 2002c).

Open water, cienegas, marshy seeps, or saturated soil are typically in the vicinity of flycatcher territories and nests; flycatchers sometimes nest in areas where nesting substrates are in standing water (USFWS 2005c). Hydrological conditions at a particular site can vary remarkably in the arid Southwest within a season and between years. At some locations, particularly during drier years, water or saturated soil is only present early in the breeding season (i.e., May and part of June). The total absence of water or visibly saturated soil has been documented at several sites where the river channel has been modified (e.g. creation of pilot channels), where modification of subsurface flows has occurred (e.g. agricultural runoff), or as a result of changes in river channel configuration after flood events (USFWS 2005c).

The flycatcher's habitat is dynamic and can change rapidly: nesting habitat can grow out of suitability; saltcedar habitat can develop from seeds to suitability in five years; heavy runoff can remove or reduce habitat suitability in a day; or river channels, floodplain width, location, and vegetation density may change over time. Over-mature or young habitat not suitable for nest placement can be occupied and used for foraging and shelter by migrating, breeding, dispersing, or non-territorial flycatchers (USFWS 2005c). That same habitat may subsequently grow or cycle into habitat used for nest placement. Because of those changes, flycatcher "nesting habitat" is often described as occupied, suitable, or potential (USFWS 2002c). Areas other than those where nests are located (foraging, sheltering, territory defense, singing, etc.) can also be "occupied flycatcher habitat," and as a result, essential to the survival and recovery of the flycatcher (USFWS 2002c). The development of flycatcher habitat is a dynamic process involving maintenance, recycling, and regeneration of habitat. Flycatcher habitat can quickly change and vary in suitability, location, use, and occupancy over time.

Breeding Biology

Throughout its range the southwestern willow flycatcher arrives on breeding grounds in late April and May (USFWS 1995). Nesting begins in late May and early June and young fledge from late June typically through mid August, but as late as early September (USFWS 1995). Southwestern willow flycatchers typically lay three to four eggs per clutch (range 1-5). Eggs are laid at one-day intervals and are incubated by the female for about 12 days. Young fledge about 12 to 13 days after hatching. Typically one brood is raised per year, but birds have been documented raising two broods during one season and renesting after a failure. The entire breeding cycle, from egg laying to fledging, is about 28 days.

Food Habits

The southwestern willow flycatcher is an insectivore, foraging in dense shrub and tree vegetation along rivers, streams, and other wetlands. Flying insects are the most important prey of the southwestern willow flycatchers; however, they will also glean larvae of non-flying insects from vegetation (USFWS 1995). The major prey items of the southwestern willow flycatcher (in Arizona and Colorado) consist of true flies (Diptera); ants, bees, and wasps (Hymenoptera); and true bugs (Hemiptera). Other insect prey taxa include leafhoppers (Homoptera: Cicadellidae); dragonflies and damselflies (Odonata); and caterpillars (Lepidoptera larvae). Non-insect prey includes spiders (Araneae), sowbugs (Isopoda), and fragments of plant material.

Territory and Home Range

Southwestern willow flycatcher territory size likely fluctuates with population density, habitat quality, and nesting stage. Estimated territory sizes are 0.59 to 3.21 acres for monogamous males and 2.72 to 5.68 acres for polygamous males at the Kern River, 0.15 to 0.49 acres for birds in a 1.48 to 2.22 acre patch on the Colorado River, and 0.49 to 1.24 acres in a 3.71 acre patch on the Verde River (USFWS 2005c). Territories are established within a larger patch of appropriate habitat sufficient to contain several nesting pairs of flycatchers.

Movements

Most southwestern willow flycatchers return to former breeding sites, although flycatchers can regularly move among sites within and between years (USFWS 2005c). Within-drainage movements are more common than between-drainage movements. Year-to-year movements of birds have been detected between the San Pedro/Gila River confluence and Roosevelt Lake, the Verde River near Camp Verde and Roosevelt Lake, and the Little Colorado River near Greer and Roosevelt Lake (USFWS 2005c). Typical distances moved range from 1.2 to 18 miles. However, long-distance movements of up to 137 miles have been observed on the lower Colorado River and Virgin River (USFWS 2005c). Breeding groups of southwestern willow flycatchers act as a meta-population.

Rangewide Distribution and Abundance

Rangewide population is estimated at 500 to 1000 pairs (USFWS 2002c). Since 1993, a total of 122 sites once known to have breeding flycatchers are no longer occupied by nesting birds. There are currently 265 known southwestern willow flycatcher breeding sites in the United States (all sites from 1993 to 2004 where a resident flycatcher has been detected) holding an estimated 1,256 territories (Durst et al. 2005). Numbers have increased since the bird was listed and some habitat remains unsurveyed; however, after nearly a decade of intense surveys, the existing known numbers are just past the upper end of early estimates. About 40 percent of the 1,256 territories (Table 3) currently estimated throughout the subspecies' range is in three locations (Cliff/Gila Valley, Roosevelt Lake, San Pedro/Gila confluence).

Rangewide, the population is comprised mostly of extremely small, widely-separated breeding groups including unmated individuals. However, across the bird's range, 3 percent of all sites support greater than 50 territories (Durst et al. 2005).

The distribution of breeding groups is highly fragmented, often separated by considerable distance. In Arizona, about a 55-mile straight-line distance exists between breeding flycatchers at

Roosevelt Lake and the next closest territories on the San Pedro River or Verde River. Long distances between breeding groups and small size of those populations reduces meta-population stability and increases the risks of local extirpation due to stochastic events, predation, cowbird parasitism, and other factors (USFWS 2002c). Conversely, having about 40 percent of the entire subspecies at three locations can also create instability should catastrophic events occur that would remove or significantly reduce habitat suitability at those places. The survival and recovery of the flycatcher is not dependent on having a few locations with large numbers of birds, but rather properly distributed populations throughout the subspecies' range placed close together (USFWS 2002c).

Table 3. Rangewide population status for the southwestern willow flycatcher based on 1993 to 2004 survey data for Arizona, California, Colorado, New Mexico, Nevada, Utah, and Texas (Durst et al. 2005).

State	Number of sites with SWWF territories 1993-04[1]	Percentage of sites with SWWF territories 1993-04	Number of territories[2]	Percentage of total territories
Arizona	112	42.3 %	544	43.3 %
California	91	34.3 %	200	15.9 %
Colorado	5	3.8 %	65	5.2 %
Nevada	13	4.9 %	68	5.4 %
New Mexico	36	13.6 %	372	29.6 %
Utah	3	1.1 %	7	0.6%
Texas	?	?	?	?
Total	265	100 %	1256	100 %

1 Site boundaries are not defined uniformly throughout the bird's range.
2 Total territory numbers recorded are based upon the most recent year's survey information from that site between 1993 and 2004.

Arizona Distribution and Abundance

Historical records for Arizona indicate that the former range of the southwestern willow flycatcher included portions of all major river systems (Colorado, Salt, Verde, Gila, Santa Cruz, and San Pedro) and major tributaries, such as the Little Colorado River and headwaters, and White River. In 2005, 483 territories were known from 42 sites along 15 drainages in Arizona (English et al. 2006).

As reported by English et al. (2006), the largest concentrations of breeding willow flycatchers in Arizona in 2005 were at the Winkelman Study Area at the San Pedro/Gila River confluence (348 flycatchers, 185 territories); at Roosevelt Lake (278 flycatchers, 153 territories); the Big Sandy River (near US 93) (62 flycatchers, 33 territories); Gila River, Safford area (54 flycatchers, 31 territories); Topock Marsh on the Lower Colorado River (36 flycatchers, 21 territories); Verde River (38 flycatchers, 23 territories), and Alamo Lake (26 flycatchers, 14 territories). Combined, the Winkelman Study Area and Roosevelt Lake make up 338 (71%) of the 483 territories known in the state.

While numbers have significantly increased in Arizona, overall distribution of flycatchers throughout the state has changed little. Note that 85 percent of the growth in Arizona since listing has occurred at two locations. Recovery and survival of the flycatcher depends not only on numbers of birds, but territories and sites that are well distributed (USFWS 2002c). Currently, population stability in Arizona is believed to be largely dependent on the presence of two large populations (San Pedro/Gila River confluence and Roosevelt Lake). Therefore, the result of catastrophic events or losses of significant populations either in size or location could greatly change the status and survival of the bird. Conversely, expansion into new habitats or discovery of other populations would improve the known stability and status of the flycatcher.

Mortality and Survivorship

There are no extensive records for the actual causes of adult southwestern willow flycatcher mortality. Incidents associated with nest failures, human disturbance, and nestlings are typically the most often recorded due to the static location of nestlings, eggs, and nests. As a result, nestling predation and brood parasitism are the most commonly recorded causes of southwestern willow flycatcher mortality. Band returns at Roosevelt Lake determined that the average adult return rate from 1998 to 2004 was 60 percent with survivorship estimated at 65 percent (Newell et al. 2005). From 1998 to 2004, the average nestling return rate was 28 percent and survivorship estimated at 35 percent (Newell et al. 2005).

Reproductive success

Intensive nest monitoring efforts in California, Arizona, and New Mexico have shown that cowbird parasitism and predation can result in the following: failure of the nest; reduced fecundity in subsequent nesting attempts; delayed fledging; and reduced survivorship of late-fledged young. Cowbirds have been documented at more than 90 percent of sites surveyed. The probability of a southwestern willow flycatcher successfully fledging its own young from a cowbird parasitized nest is low (i.e. <5%). Also, nest loss due to predation appears consistent from year to year and across sites, generally in the range of 30 to 50 percent.

Survey History

The Gila River corridor in the Duncan vicinity has been surveyed for southwestern willow flycatcher. In 1998, a flycatcher nest was found in a saltcedar approximately 1,450 feet upstream of the Highway 75 bridge. In 1999, a nest was located to the east of the 1998 nest, again, roughly 1,450 feet upstream of the existing bridge. The nest was constructed in a cottonwood. In 2001, one adult flycatcher was detected near Duncan, Arizona, while no pairs or nests were found (Paradzick et al. 2002). In 2002, three resident adults, two territories, one mated pair, and one nest were found in the Duncan area (Smith et. al. 2003). No other flycatcher surveys have been conducted in this reach of the Gila River since 2002.

4.1.2 Critical Habitat

The USFWS published on October 19, 2005, a final rule designating 737 miles of waters within the 100-year floodplain in California, Arizona, Nevada, Utah, and New Mexico as critical habitat for an endangered migratory bird, the southwestern willow flycatcher. The designation identifies the stream- and lake-edge habitats that are believed essential to help recover the species. This is the second time the USFWS has designated critical habitat for the southwestern willow flycatcher. This critical habitat designation was completed in compliance with a Sept. 30, 2003, opinion issued by the District Court of New Mexico (Center for Biological Diversity v Norton, (iv. No. 02-1067 LH/RHS (D.N.M)).

The critical habitat designation includes locations that support ten or more flycatcher territories or which provide opportunities for nesting birds to access other flycatcher populations. Dispersing to other territories ensures that birds can expand into other locales and maintain genetic flow among territories, providing overall population stability. The locations designation also provides migration stopover habitats and habitat for non-breeding and dispersing southwestern willow flycatchers.

Primary Constituent Elements (PCE)

All PCEs of critical habitat for the SWWF are found in the riparian ecosystem within the 100-year floodplain or flood prone area. Based on current knowledge of the life history, biology, and ecology of the species and the requirements of the habitat to sustain the essential life history functions of the species, the USFWS has determined that the southwestern willow flycatcher's primary constituent elements are:

(1) Riparian habitat in a dynamic successional riverine environment (for nesting, foraging, migration, dispersal, and shelter) that comprises:

(a) Trees and shrubs that include Gooddings willow (*Salix gooddingii*), coyote willow (*Salix exigua*), Geyers willow (*Salix geyerana*), arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), yewleaf willow (*Salix taxifolia*), pacific willow (*Salix lasiandra*), boxelder (*Acer negundo*), tamarisk (*Tamarix ramosissima*), Russian olive (*Eleagnus angustifolia*), buttonbush (*Cephalanthus occidentalis*), cottonwood (*Populus fremontii*), stinging nettle (*Urtica dioica*), alder (*Alnus rhombifolia, Alnus oblongifolia, Alnus tenuifolia*), velvet ash (*Fraxinus velutina*), poison hemlock (*Conium maculatum*), blackberry (*Rubus ursinus*), seep willow (*Baccharis salicifolia, Baccharis glutinosa*), oak (*Quercus agrifolia, Quercus chrysolepis*), rose (*Rosa californica, Rosa arizonica, Rosa multiflora*), sycamore (*Platinus wrightii*), false indigo (*Amorpha californica*), Pacific poison ivy (*Toxicodendron diversilobum*), grape (*Vitus arizonica*), Virginia creeper (*Parthenocissus quinquefolia*), Siberian elm (*Ulmus pumila*), and walnut (*Juglans hindsii*).

(b) Dense riparian vegetation with thickets of trees and shrubs ranging in height from 6 to 98 feet. Lower-stature thickets (6 to 13 feet tall) are found at higher elevation riparian forests and tall-stature thickets are found at middle- and lower elevation riparian forests;

(c) Areas of dense riparian foliage at least from the ground level up to approximately 13 feet above ground or dense foliage only at the shrub level, or as a low, dense tree canopy;

(d) Sites for nesting that contain a dense tree and/or shrub canopy (the amount of cover provided by tree and shrub branches measured from the ground) (*i.e.*, a tree or shrub canopy with densities ranging from 50 percent to 100 percent);

(e) Dense patches of riparian forests that are interspersed with small openings of open water or marsh, or shorter/sparser vegetation that creates a mosaic that is not uniformly dense. Patch size may be as small as 0.25 acre or as large as 175 acres; and

(2) A variety of insect prey populations found within or adjacent to riparian floodplains or moist environments, including: flying ants, wasps, and bees (Hymenoptera); dragonflies (Odonata); flies (Diptera); true bugs (Hemiptera); beetles (Coleoptera); butterflies/moths and caterpillars (Lepidoptera); and spittlebugs (Homoptera).

The primary constituent elements described above are results of the dynamic river environment that germinates, develops, maintains, and regenerates the riparian forest and provides food for breeding, non-breeding, dispersing, territorial, and migrating southwestern willow flycatchers. Anthropogenic factors such as dams, irrigation ditches, or agricultural field return flow can assist in providing conditions that support flycatcher habitat. Because the flycatcher exists in disjunct breeding populations across a wide geographic and elevation range, and is subject to dynamic

events, critical habitat river segments described below are essential for the flycatcher to maintain metapopulation stability, connectivity, gene flow, and protect against catastrophic loss. All river segments designated as southwestern willow flycatcher critical habitat are within the geographical area occupied by the species and contain at least one of the primary constituent elements. It is important to recognize that the PCEs are present throughout the river segments selected (PCE 1a and 2), but the specific quality of riparian habitat for nesting (PCE 1b, 1c, 1d, 1e), migration (PCE 1), foraging (PCE 1 and 2), and shelter (PCE 1) will not remain constant in their condition or location over time due to succession (*i.e.*, plant germination and growth) and the dynamic environment in which they exist.

Critical Habitat Units

USFWS designated stream segments in 15 Management Units found in 5 Recovery Units as critical habitat for the southwestern willow flycatcher. The stream segments designated occur in southern CA, southern NV, southwestern UT, AZ and NM. Lands designated are under private, local, county, State, Tribal, and Federal ownership. The action area is located in the Gila Recovery Unit/Upper Gila Management Unit, which includes the Gila River watershed, from its headwater in southwestern NM downstream to near the confluence with the Colorado River. In 2002, the 588 known flycatcher territories (51 percent of the rangewide total) were distributed primarily on the Gila and lower San Pedro Rivers (UFWS 2005c). A total of 505 territories were detected in 2003 within the segments proposed in this Management Unit. Many sites are small (less than five territories), but sections of the upper Gila River, lower San Pedro River (including its confluence with the Gila River), and the Tonto Creek and Salt River inflows within the high water mark of Roosevelt Lake support the largest sites known within the subspecies' range. In 2001, private lands hosted 50 percent of the territories, including one of the largest known flycatcher populations in the Cliff-Gila Valley, NM (USFWS 2005c). Approximately 50 percent of the territories were on government-managed lands (USFWS 2005c). While 58 percent of territories were in native dominated habitats, flycatchers in this Recovery Unit also make extensive use of exotic (77 territories) or exotic dominated (108 territories) habitats (primarily tamarisk).

4.1.3 Habitat Evaluation and Suitability

The action area is within the current range of SWWF. The action area is located along the Gila River near the Town of Duncan, Greenlee County, Arizona, which is delineated by the USFWS as within the current range of SWWF. Nesting SWWF has been detected along the Gila River near the Town of Duncan, Greenlee County. This population is approximately 4 miles northwest of the action area. Additional SWWF populations are known from the Gila River near the Town

of Safford, Graham County, Arizona. This population is approximately 30 miles northwest of the action area. There is no record of surveys and no known populations of SWWF in the action area.

The action area does not contain suitable vegetation for SWWF habitat. Vegetation in the action area has been disturbed by floodwaters, agriculture, road construction and maintenance, and utility line installation and maintenance. As a result of these disturbances, the riparian vegetation that may have been prevalent at one time is no longer present. Vegetation in the action area now consists primarily of tamarisk, desert broom, kochia, and Russian thistle. Vegetation structural diversity in the action area is low, with shrubs and forbs of 1 to 2 feet in height dominating. The action area does not contain trees or other prevalent riparian plant species. Because most the bank stabilization area would be covered with soil and seeded following construction, it is possible for some regrowth of riparian vegetation. However, it is unlikely for large or dense vegetation to reestablish given the shallow soil depth covering the stabilization structures and the difficulty of deep root systems to become established within the stabilization structures.

Photo 2. Early successional invasion species such as tamarisk and Russian thistle in the action area. February 2006.

Photo 3. A stringer of mature cottonwoods and willow trees lies on the north bank of the river, opposite the action site. February 2006.

A stringer (approximately 0.2 acres) of mature cottonwoods and willow trees lies on the north bank of the river, opposite the action site (Photo 3). This patch could potentially provide foraging habitat. However, the area is likely too dry and open in the understory to support nesting flycatchers.

Critical Habitat

The action area is located in designated critical habitat for the SWWF. The USFWS created 21 critical habitat management units through the southwestern U.S. The action area is located in the Upper Gila Management Unit which encompasses 17,043 areas and 162 miles of the Upper Gila River from the Turkey Creek/Gila River confluence on the Gila National Forest, NM, downstream to San Carlos Apache Tribal Land, AZ. SWWF have been detected nesting along these stream segments in the Upper Gila Management Unit since 1993. A total of 16 breeding sites (7 in NM and 9 in AZ) are known in the Upper Gila Management Unit.

All PCEs of critical habitat for the SWWF are found in riparian ecosystem within the 100-year floodplain or flood prone area. USFWS has determined that the SWWF's PCEs include riparian habitat in a dynamic successional riverine environment (for nesting, foraging, migration,

dispersal, and shelter) that are comprised of dense riparian vegetation with high structural diversity slow moving surface water or moist soil conditions.

While located within designated critical habitat, the action area does not contain PCEs for SWWF. Vegetation in the action area consists primarily of tamarisk, desert broom, and Russian thistle (Photo 2). Vegetation structural diversity in the action area is low, with shrubs and forbs of 1 to 2 feet in height dominating. The action area does not contain trees or other prevalent riparian plant species. Surface water is present in the Gila River. Currently, the active perennial channel is located on the north bank of the river, while the action area is on the south bank of the river. Should the active channel migrate to the south bank, surface water would be adjacent to the re-aligned roadway and bank stabilization. Because most the bank stabilization area would be covered with soil and seeded following construction, it is possible for some regrowth of riparian vegetation. However, it is unlikely for large or dense vegetation to reestablish given the shallow nature of the soil cover on the stabilization structures and the difficulty of deep root systems to become established.

4.1.4 Analysis and Determination of Effects

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

The construction of Stateline Road and the adjacent bank protection would have no direct effect on SWWF breeding or roosting habitat. Vegetation in the action area has been disturbed by floodwaters, agriculture, road construction and maintenance, and utility line installation and maintenance; resulting in the combination of vegetation types and vegetation structural diversity that does not resemble habitat known to support breeding, nesting, foraging, migrating, or roosting SWWF. Consequently, the action area does not contain suitable vegetation for SWWF habitat, and SWWF are not anticipated to occur in the action area.

Noise produced by vehicles and construction activities may affect SWWF foraging and dispersal behavior. A stringer (approximately 0.2 acres) of mature cottonwoods and willow trees occur on the north bank of the river, opposite the action site (Photo 3). The area is likely too dry and open in the understory to support nesting flycatchers, but this patch could potentially provide foraging habitat to SWWF. Noise levels from the proposed action would not be substantially higher than

existing background noise levels from the use of agricultural machinery associated with crop production that occurs adjacent to the action site and nearby the area of suitable foraging habitat on the north back of the river.

The County would not remove accumulated debris or vegetation from the stabilized bank or perform other work that would disturb the site once the project is completed. Similar bank stabilization projects in Greenlee County that utilize heavy tire construction are designed for minimal maintenance and do not require regular maintenance actions (pers. comm. Phillip Ronnerud). It is anticipated that the proposed action would similarly not require regular or periodic maintenance (pers. comm. Phillip Ronnerud). Specific, long-term maintenance may be required on a case-by-case basis. The County would maintain the relocated Stateline Road as required by the level of use and service.

Seeding and planting activities following construction could result in some growth of riparian vegetation in the action area. It is unlikely for large or dense vegetation to become established in the action area given the shallow nature of the soil cover that would occur on the bank stabilization facilities and the difficulty of deep root systems to become established. Therefore, riparian vegetation that could become established would be marginally suitable habitat for SWWF.

Effects to Critical Habitat

As described in Section 4.1.3, the action area does not contain PCEs for SWWF. Therefore, the proposed action would not result in effects to critical habitat of SWWF. In addition, the potential for PCEs to occur on the bank stabilization facilities after completion of the proposed action is unlikely. The shallow nature of the soil cover on the stabilization structures and the difficulty of deep root systems to become established would preclude the development of PCEs at the site. Therefore, any maintenance activities that could occur on the bank stabilization structures, which would be an interdependent activity to the proposed action, would not affect critical habitat of SWWF in the action area.

Avoidance and Minimization Measures

The County would implement the following measures to avoid and minimize potential effects of the proposed action to SWWF or their critical habitat.

- To minimization construction-related noise, construction activities would be limited to the action area and adjacent staging areas and would not occur near this stringer of vegetation on the north bank of the river.

- If maintenance activities are required at the bank stabilization facilities and suitable habitat for SWWF becomes established at this location, maintenance activities would occur during the non-breed season (October through March), when SWWF would not be present in the area.

Cumulative Effects

Cumulative effects are those adverse effects of future non-Federal (State, local government, and private) actions that are reasonably certain to occur in the action area. Future Federal actions would be subject to the consultation requirements established in section 7 of the Act and, therefore, are not considered cumulative to the proposed action. Some activities on State and private lands will require Federal permits (such as Clean Water Act 404 or 402 permits), and thus would be subject to Section 7 consultation. In the absence of a Federal nexus, activities that may result in a take of a listed animal can be addressed through the section 10(a)(1)(B) permit process.

Lands in the Gila River bottom and adjacent croplands are privately and state owned. Periodic flooding in the Gila River bottom precludes most development in the river channel; however, recreational activities, such as off-road vehicle use, occur in the river channel. Woodcutting of riparian trees may affect quality of flycatcher habitat. Dike construction and maintenance, groundwater pumping, return flow, and agricultural chemicals have likely affected flow regimes, water quality, and channel morphology. Use of State lands is primarily as rangeland. However, as State lands reach a certain market value, they are often sold and then become available for various types of development. The proposed action in combination with other actions would not result in incremental cumulative effects to SWWF or their critical habitat. The proposed action would not effect land use or land value in the action area or vicinity; therefore, activity such as off-road vehicle use, woodcutting, agricultural practices, and land sales would not increase or decrease as a result of the proposed action.

Determination of Effects

The proposed avoidance and minimization measures described above would reduce potential affects to SWWF. With implementation of the measure to minimize the effects of construction-related noise, the potential effects to SWWF from construction of the proposed action would be insignificant. With the implementation of the measure to avoid maintenance activities during the breeding season, if suitable habitat for SWWF becomes established at the site, the potential effects to SWWF would be unlikely and discountable. After reviewing the current status of the SWWF, the habitat suitability for the action area, the effects of the proposed action, the avoidance and minimization measures, and the potential for cumulative effects, the proposed

action may affect SWWF and its critical habitat but is not likely to adversely affect SWWF or its critical habitat.

4.2 Razorback Sucker

Based on the presence of critical habitat in the action area, the razorback sucker was identified for detailed evaluation. Life history information, habitat suitability, and impacts determination are provided below.

4.1.5 Life History Information

The razorback sucker was listed as an endangered species November 22, 1991 (USFWS 1991). The razorback sucker Recovery Plan was released in 1998 (USFWS 1998) and updated with the razorback sucker Recovery Goals in 2002 (USFWS 2002d) Critical habitat was designated in 15 river reaches in the historical range of the razorback sucker on March 21, 1994 (USFWS 1994). Critical habitat included portions of the Colorado, Duchesne, Green, Gunnison, San Juan, White, and Yampa rivers in the Upper Colorado River Basin, and the Colorado, Gila, Salt, and Verde rivers in the Lower Colorado River Basin. The conservation role of the critical habitat is largely intact in all 15 river segments.

The razorback sucker was once abundant in the Colorado River and its major tributaries throughout the Basin, occupying 3,500 miles of river in the United States and Mexico (USFWS 1994). Records from the late 1800s and early 1900s indicated the species was abundant in the lower Colorado and Gila river drainages (USFWS 1991).

Adult razorback suckers use most of the available riverine habitats, although there may be an avoidance of whitewater type habitats. Main-channel habitats tend to be low velocity ones such as pools, eddies, nearshore runs, and channels associated with sand or gravel bars (USFWS 1991). Adjacent to the main channel, backwaters, oxbows, sloughs, and flooded bottomlands are also used by this species. From studies conducted in the upper Colorado River basin, habitat selection by adult razorback suckers changes seasonally. They move into pools and slow eddies from November through April, runs and pools from July through October, runs and backwaters during May, and backwaters, eddies, and flooded gravel pits during June. In early spring, adults move into flooded bottomlands. They use relatively shallow water (ca. 3 feet) during spring, and deeper water (5-6 feet) during winter.

Razorback suckers also use reservoir habitat, where the adults may survive for many years. In reservoirs they use all habitat types, but prefer backwaters and the main impoundment (USFWS 1998). Much of the information on spawning behavior and habitat comes from fishes in

reservoirs where observations can readily be made. Spawning takes place in the late winter to early summer depending upon local water temperatures. Various studies have presented a range of water temperatures at which spawning occurs. In general, temperatures between 50° to 68° F are appropriate. They typically spawn over cobble substrates near shore in water 3-10 feet deep (USFWS 1991). There is an increased use of higher velocity waters in the spring, although this is countered by the movements into the warmer, shallower backwaters and inundated bottomlands in early summer (USFWS 1991). Spawning habitat is most commonly over mixed cobble and gravel bars on or adjacent to riffles (USFWS 1991).

Habitat needs of larval and juvenile razorback suckers are reasonably well known. In reservoirs, larvae are found in shallow backwater coves or inlets (USFWS 1998). In riverine habitats, captures have occurred in backwaters, creek mouths, and wetlands. These environments provide quiet, warm water where there is a potential for increased food availability. During higher flows, flooded bottomland and tributary mouths may provide these types of habitats.

Razorback suckers are somewhat sedentary; however, considerable movement over a year has been noted in several studies (USFWS 1998). Spawning migrations have been observed or inferred in several locales (USFWS 1991). During the spring spawning season, razorbacks may travel long distances in both lacustrine and riverine environments, and exhibit some fidelity to specific spawning areas (USFWS 1998).

Range-wide, the status of razorback sucker is exceedingly poor due to lack of significant recruitment, ongoing habitat loss, and continuing pressure from nonnative species. The range-wide trend for the razorback sucker is a continued decrease in wild populations due to a lack of sufficient recruitment and the loss of old adults due to natural mortality. USFWS recovery efforts under the Recovery Implementation Program are working towards the goals of replacing the aging population in Lake Mohave, restoring the Lake Havasu population, and increasing the lower river populations.

Stocking efforts in the Upper Colorado River Basin, and in lakes Mohave and Havasu and the lower Colorado River Basin below Parker Dam are ongoing, with a 30,000-fish replacement for Lake Havasu completed in 2001. The most critical of these efforts is the replacement of the Lake Mohave population using wild-caught larvae from the lake. By the end of 2001, the initial goal to stock 50,000 sub-adult fish into Lake Mohave was reached. The Lake Mohave efforts will continue to meet the second goal, which is to establish a population of 50,000 adults.

Historically, the razorback sucker was found at least as far upstream as Fort Thomas but was extirpated by the late 1970's. Hundreds of thousands of small razorback suckers were released into the Gila River, Bonita Creek, and Eagle Creek from 1981 through 1987; however, mortality

of released fish was very high, probably due mostly to predation by nonnative fishes (USFWS 2002d). These releases have apparently not been successful in establishing a self-sustaining population. No razorback suckers were found during preliminary surveys of the Gila River in 1991, or during surveys at five sites near Safford in 1997 (USFWS 2002d). However, it is likely that small or very small numbers of the released razorback suckers survived in the Gila River, Eagle Creek, and Bonita Creek.

In the action area, critical habitat was designated for the razorback sucker in 1994 on the Gila River and its 100-year floodplain from the Arizona-New Mexico border to Coolidge Dam, including San Carlos Reservoir. The 100-year event through the action area is a 28,000 cfs flood, which would inundate lands below 3,658 feet elevation (FEMA 1987).

4.1.6 Razorback Sucker Critical Habitat

Critical habitat was designated in 15 river reaches in the historical range of the razorback sucker on March 21, 1994. Critical habitat included portions of the Colorado, Duchesne, Green, Gunnison, San Juan, White, and Yampa rivers in the Upper Colorado River Basin, and the Colorado, Gila, Salt, and Verde rivers in the Lower Colorado River Basin. There are three areas that are considered primary constituent elements: water, physical habitat, and the biological environment (USFWS 1998). The water element refers to water quality and quantity. Water quality is defined by parameters such as temperature, dissolved oxygen, environmental contaminants, nutrients, turbidity, and others. Water quantity refers to the amount of water that must reach specific locations at a given time of year to maintain biological processes and to support the various life stages of the species. The physical habitat element includes areas of the Colorado River system that are or could be suitable habitat for spawning, nursery, rearing, and feeding, as well as corridors between such areas. Habitat types include bottomland, main and side channels, secondary channels, oxbows, backwaters, and other areas in the 100-year floodplain, which when inundated may provide habitat or corridors to habitat necessary for the feeding and nursery needs of the razorback sucker. The biological environment element includes living components of the food supply and interspecific interactions. Food supply is a function of nutrient supply, productivity, and availability to each life stage. Negative interactions include predation and competition with introduced nonnative fishes.

4.1.7 Habitat Evaluation and Suitability

The action area is within the historical range, but outside the current range of the razorback sucker. Historically, razorback suckers in Arizona inhabited the Colorado, Gila, Salt, Verde, and San Pedro rivers. Razorback sucker are currently found in the Green River, upper Colorado

River, and San Juan River subbasins; lower Colorado River between Lake Havasu and Davis Dam; reservoirs of Lakes Mead and Mohave; and in small tributaries of the Gila River subbasin (Verde River, Salt River, and Fossil Creek) (USFWS 2002e). Populations in the Gila River were extripated by the late 1970's. Razorback suckers were released into the Gila River, Bonita Creek, and Eagle Creek from 1981 through 1987; however, mortality of released fish was very high, probably due mostly to predation by nonnative fishes (USFWS 2002d). These releases were more than 30 miles northwest of the action area.

The Gila River is perennial in the vicinity of the action area. In this stretch of the Gila River some habitat components for the razorback sucker are present. However, the Gila River in Duncan Valley is known to contain nonnative fishes that prey upon on razorback sucker. Because of predation by nonnative fishes, razorback sucker are unable to establish or persist in the reach of the Gila River. As a result, razorback sucker are not known to occur in the Duncan Valley reach of the Gila River or in the vicinity of the action area.

Critical Habitat

The action area is located in designated critical habitat for the razorback sucker. Critical habitat was designated in 15 river reaches in the historical range of the razorback sucker on March 21, 1994. Critical habitat included portions of the Colorado, Duchesne, Green, Gunnison, San Juan, White, and Yampa rivers in the Upper Colorado River Basin, and the Colorado, Gila, Salt, and Verde rivers in the Lower Colorado River Basin. Known constituent elements in the Gila River include water, physical habitat, and biological environment as required for each particular life stage for the razorback sucker. All constituent elements of critical habitat for the razorback sucker are found within the 100-year floodplain.

The 100-year floodplain is generally included as part of the critical habitat designation of the razorback sucker; however, only those portions of the floodplain that contain the constituent elements are considered part of critical habitat. Parts of the proposed action would occur within the 100-year floodplain of the Gila River; however, the project area does not contain constituent elements of critical habitat. The constituent elements of razorback sucker critical habitat include water, physical habitat, and biological environment. Water of sufficient quantity is found in the active perennial channel of the Gila River located on the north side of the 100-year floodplain. The project area does not include the active perennial channel of the Gila River and would have no impact on the active perennial channel. Furthermore, agricultural runoff and water diversions in the project vicinity suggest that water quality would not meet requirements of critical habitat for temperature, dissolved oxygen, or contaminants. Physical habitat includes inhabited or potentially habitable areas used for spawning, nursery, feeding, and rearing or corridors between

these areas. These physical habitats are found in areas of sufficient water quantity and quality. In the 100-year floodplain that would only include the active perennial channel of the Gila River, which is located outside of the project area. The biological environment refers to food supply, predation, and competition elements of suitable habitat. Thirty-seven nonnative fish species have become established in the lower basin of the Colorado River, which includes the Gila River basin (Mincley 1985). Nonnative fish species limit the success of razorback sucker recruitment. In the Gila River basin, limited distribution and localized extirpation of razorback suckers has been attributed to predation by nonnative flathead catfish (*Pylodictis olivaris*) and yellow bullhead (*Ameiurus natalis*) (Hendrickson 1994). The presents of nonnative fish suggests that the biological environment constituent element of critical habitat is not present in most segments of the Gila River basin, including those portions of the project area.

4.1.8 Analysis and Determination of Effects

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

The construction of Stateline Road and the adjacent bank protection would have no direct effects on razorback sucker. Because of the presence of predatory nonnative fish species in the Gila River, razorback sucker are unable to establish or persist in the Duncan Valley reach of the Gila River or in the vicinity of the action area. As a result, the area does not contain any known populations of razorback sucker, the action area does not contain suitable habitat for razorback sucker, and razorback sucker is not expected to occur in the action area.

Indirect effects to razorback suckers may occur from sedimentation, deposition of eroded soils, and accidental releases of hazardous materials into the Gila River as a result of construction activities or immediately following construction activities during high flows. Excess sediment in water bodies can inhibit reproduction by covering the eggs of fish, abrade the tissues of fish, and clog the gills of fish. These effects would be minimized by staging and storing construction equipment out of the river bed on adjacent agricultural fields, employing erosion protective measures, and conducting construction activities between July and October, which would avoid peak flows in the Gila River. These measures would be employed as part of the proposed action. Sedimentation and deposition of eroded soils that may occur following construction activities

would be minimized through the post-construction seeding activities that would occur as part of the proposed action.

It is anticipated that debris (i.e. logs, branches and other floating material) and sediment could accumulate around the bank stabilization facilities during periods of high flows (pers. comm. Phillip Ronnerud), which could necessitate periodic maintenance of these facilities. Maintenance activities of the bank stabilization facilities would be an interdependent action to the proposed action. Under the circumstances that the action area develops into suitable habitat for razorback sucker in the future and, as described above, maintenance activities are necessary to remove debris or sediment from the bank stabilization facilities, razorback sucker could be directly and indirectly affected. Maintenance activities, if occurring in or adjacent to water, could result in direct effects to razorback sucker. Sedimentation, deposition of eroded soils, and accidental releases of hazardous materials into the Gila River, which could occur as a result of maintenance activities, could result indirectly affect razorback sucker.

Effects to Critical Habitat

As described in Section 4.1.7, the action area does not contain PCEs for razorback sucker. Therefore, the proposed action would not result in direct effects to critical habitat of razorback sucker. Soil erosion and deposition could result in effects to unknown PCEs found downstream of the action area. Maintenance activities of the bank stabilization structures, if necessary, could also result in soil erosion and deposition which may result in effects to unknown PCEs found downstream of the action area. Under the circumstances that PCEs become established in the action area and maintenance activities are necessary to remove debris or sediment from the bank stabilization facilities, critical habitat for the razorback sucker could be directly affected.

Avoidance and Minimization Measures

The County would implement the following measures to avoid and minimize potential effects of the proposed action to razorback sucker or their critical habitat. Note that some of these measures would be implemented as part of the proposed action, as described in Section 2.0.

- Best Management Practices (BMP) would be implemented during construction activities to minimize soil erosion, sediment deposition, and accidental releases of hazardous materials. BMPs could include, but would be not limited to, silt fencing and straw-bails set perpendicular to slopes or contours. Specific BMPs would be developed as a part of the County's compliance with Section 402 of the Clean Water Act. In compliance with this act, the County would obtain a National Pollutant Discharge Elimination System (NPDES) permit and prepare a Storm Water Pollution Prevention Plan (SWPPP), which

would incorporate temporary erosion control measures during construction, and BMPs for the control and prevention of release of water pollutants. The SWPPP would identify the pollution control measures that would be implemented to reduce soil erosion, while containing and minimizing the construction pollutants (including oils, gasoline, and other chemicals released by construction equipment and vehicles) that may be released to surface waters through runoff during a storm event.

- Staging and equipment and materials storage for construction and maintenance activities would occur outside of the river bed on adjacent agricultural fields in an area above the 100-year floodplain and outside of areas where sheet flooding may occur.

- Following construction, the disturbed soils at the action area would be seeded with shrubs and grasses native to the area. Cottonwood and willow cuttings would be placed at strategic locations after construction activities have been completed to assist in bank stabilization.

- Construction activities would occur from April to mid-June to avoid peak flows in the Gila River.

- Construction and maintenance activities would not occur in flowing water. If flowing water in the Gila River occurs at or adjacent to the action area during the April to mid-June construction timeframe, construction activities would be halted until water levels recede back towards the perennial channel and the action area is outside of flowing water.

- If maintenance activities are required at the bank stabilization facilities, applicable BMPs would be implemented, similar to those that will be developed as part of a construction SWPPP, to minimize soil erosion, sediment deposition, and accidental releases of hazardous materials into the river.

Cumulative Effects

Cumulative effects are those adverse effects of future non-Federal (State, local government, and private) actions that are reasonably certain to occur in the action area. Future Federal actions would be subject to the consultation requirements established in Section 7 of the Act and, therefore, are not considered cumulative to the proposed action. Some activities on State and private lands will require Federal permits (such as Clean Water Act 404 or 402 permits), and thus would be subject to Section 7 consultation. In the absence of a Federal nexus, activities that may result in a take of a listed animal can be addressed through the section 10(a)(1)(B) permit process.

The proposed action would not result in cumulative effects that would lead to the alteration of river conditions and loss of habitat, irrigation dewatering and channelization; or introduction of exotic fish species. Recreational, commercial, or private use of the Gila River would not be altered by the proposed action.

Determination of Effects

The proposed avoidance and minimization measures described above would reduce potential affects to razorback suckers. The current presence of predatory nonnative fish in the Gila River excludes the establishment or persistence of razorback suckers, resulting in a minimal likelihood that the species occurs in the action area. Therefore, the potential direct effects to razorback sucker from the proposed action would be discountable. The minimization measures described above would minimize and avoid potential sedimentation, deposition of eroded soils, and accidental releases of hazardous material, which otherwise could occur during construction and maintenance activities. The implementation of these measures would reduce the extent of the potential indirect effects to razorback suckers and the potential effects to critical habitat of razorback sucker to an insignificant level. After reviewing the current status of the razorback sucker, the habitat suitability for the action area, the effects of the proposed action, the avoidance and minimization measures, and the potential for cumulative effects, the proposed action may affect razorback suckers and its critical habitat but is not likely to adversely affect razorback suckers or its critical habitat.

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Appendix A
USFWS Species List for Greenlee County

Greenlee County

COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
Apache (Arizona) trout	*Oncorhynchus apache*	Threatened	This yellowish or yellow-olive cutthroat-like trout has large dark spots on body. Its dorsal, anal, and caudal fins are edged with white. It has no red lateral band.	Apache, Coconino, Gila, Graham, Greenlee, Navajo	>5000 ft	Presently restricted to cold mountain streams with many low gradient meadow reaches.	Occupies stream habitats with substrates of boulders, rocks, and gravel with some sand or silt through mixed conifer and spruce-fir forests, and montane meadows and grasslands in the White Mountains. Also managed as a sport fish under special regulations.
California Brown pelican	*Pelecanus occidentalis californicus*	Endangered	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	*Rana chiricahuensis*	Threatened	Cream colored tubercules (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	3300-8900 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.
Gila chub	*Gila intermedia*	Endangered	Deep compressed body, flat head. Dark olive-gray color above, silver sides. Endemic to Gila River Basin.	Cochise, 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 trout	*Oncorhynchus gilae*	Threatened	Deep bodied with fine profuse spotting on the body, dorsal, and adipose fins. Dorsal, anal, and pelvic fins edged in white.	Gila, Greenlee	5,000-10,000 ft	Small high mountain streams.	Fish stocked into Dude Creek in Sept 1999 and into Raspberry Creek in Nov 2000. Also occurs in New Mexico.

COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
Lesser long-nosed bat	*Leptonycteris curasoae yerbabuenae*	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	< 6000 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.
Loach minnow	*Tiaroga cobitis*	Threatened	Small (<3 inches) slender, elongated fish, olive colored with dirty white spots at the base of the dorsal and caudal fins. Breeding males vivid red on mouth and base of fins.	Apache, Graham, Greenlee, Pinal, Navajo, Gila	<8000 ft	Benthic species of small to large perennial streams with swift shallow water over cobble and gravel. Recurrent flooding and natural hydrograph important.	Presently found in Aravaipa Creek, Deer Creek, Turkey Creek, Blue River, Campbell Blue Creek, San Francisco River, Eagle Creek, North Fork East Fork Black River, and White River in Arizona, and Dry Blue Creek, Pace Creek, Frieborn Creek, the Tularosa River, West Fork Gila River, and the mainstem upper Gila River in New Mexico. Proposed critical habitat (70 FR 75545-75590, December 20, 2005) includes portions of East Fork Black River, North Fork East Fork Black River, Boneyard Creek, Aravaipa Creek, Turkey Creek, Deer Creek, Eagle Creek, San Francisco River, Blue River, Campbell Blue Creek, and Little Blue Creek found in Apache, Graham, Greenlee, and Pinal counties, Arizona, as well as portions of the Blue River, San Francisco River, Tularosa River, Negrito Creek, Pace Creek, Dry Blue Creek, Frieborn Creek, Whitewater Creek, Gila River, and its West, Middle, and East Forks in Catron, Grant, and Hidalgo counties in New Mexico.
Mexican gray wolf	*Canis lupus baileyi*	Endangered	Large dog-like carnivore with varying color, but usually a shade of gray. Distinct white lip line around mouth. Weight 60-90 pounds.	Apache, Graham, Greenlee	4,000 -12,000 ft	Chapparal, woodland, and forested areas. May cross desert areas.	Historical range is considered to be larger than the counties listed above. Unconfirmed reports of individuals in the southern part of the state (Cochise, Pima, Santa Cruz) continue to be received. Individuals may still persist in Mexico. Experimental nonessential population introduced in the Blue Primitive Area of Greenlee and Apache counties.

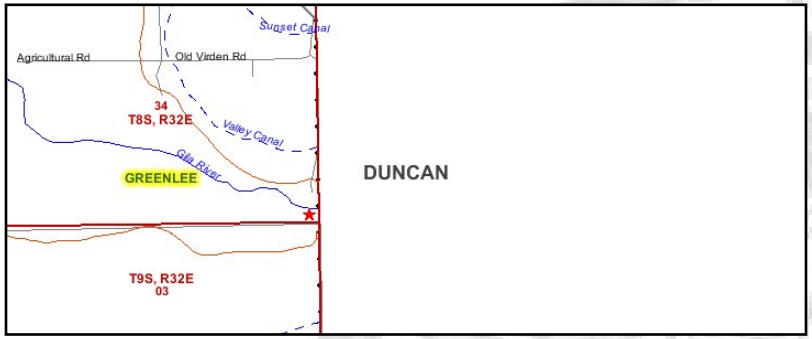
COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
Mexican spotted owl	*Strix occidentalis lucida*	Threatened	Medium sized with dark eyes and no ear tufts. Brownish and heavily spotted with white or beige.	Apache, Cochise, Coconino, Gila, Graham, Greenlee, Maricopa, Mohave, Navajo, Pima, Pinal, Santa Cruz, Yavapai	4100-9000 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). Critical habitat in Arizona occurs in Apache, Cochise, Coconino, Gila, Graham, Greenlee, Maricopa, Navajo, Pima, Pinal, Santa Cruz, and Yavapai counties.
Razorback sucker	*Xyrauchen texanus*	Endangered	Large, up to 3 feet long and up to 6 lbs, high sharp-edged keel-like hump behind the head. Head flattened on top. Olive-brown above to yellowish below.	Coconino, Gila, Graham, Greenlee, La Paz, Maricopa, Mohave, Pinal, Yavapai, Yuma	< 6000 ft	Riverine and lacustrine areas, generally not in fast moving water and may use backwaters.	Species is also found in Horseshoe reservoir (Maricopa County). Critical habitat includes the 100-year floodplain of the river through the Grand Canyon from confluence with Paria River to Hoover Dam; Hoover Dam to Davis Dam; Parker Dam to Imperial Dam. Also Gila River from Arizon/New Mexico border to Coolidge Dam; and Salt River from Hwy 60/SR77 Bridge to Roosevelt Dam; Verde River from FS boundary to Horseshoe Lake.
Southwestern willow flycatcher	*Empidonax traillii extimus*	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	<8500 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) and can be viewed at http://arizonaes.fws.gov. In Arizona there are critical habitat segments in Apache, Cochise, Gila, Graham, Greenlee, Maricopa, Mohave, Pima, Pinal, and Yavapai counties.

COMMON NAME	SCIENTIFIC NAME	STATUS	DESCRIPTION	COUNTY	ELEVATION	HABITAT	COMMENTS
Spikedace	*Meda fulgida*	Threatened	Small (<3 inches) slim with silvery sides and "spine" on dorsal fin. Breeding males brassy golden color.	Graham, Greenlee, Gila, Navajo, Pinal, Yavapai	< 6000 ft	Moderate to large perennial streams with gravel cobble substrates and moderate to swift velocities over sand and gravel substrates. Recurrent flooding and natural hydrograph important.	Presently found in Aravaipa Creek, Eagle Creek, Verde River, and the Gila River form the San Pedro River to Ashurst-Hayden Dam in Arizona, and the Gila River and its East and West Forks in New Mexico. Proposed critical habitat (70 FR 75545-75590, December 20, 2005) includes portions of the Verde River, Gila River, lower San Pedro River, Aravaipa Creek, and Eagle Creek in Graham, Greenlee, Pinal, and Yavapai counties in Arizona, and the Gila River and its East, Middle, and West Forks in Catron, Grant, and Hidalgo counties in New Mexico.
Yellow-billed cuckoo	*Coccyzus americanus*	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 riparain woodlands (cottonwood, willow, or tamarisk galleries).	Listing was found warranted, but precluded as a distinct vertebrate population segment in the western U.S. on July 25, 2001. This finding indicates that the Service has sufficient information to list the bird, but other, higher priority listing actions prevent the Service from addressing the listing of the cuckoo at this time.
Gooddings onion	*Allium gooddingii*	Conservation Agreement	Herbaceous perenial 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.

Appendix B
AGFD Environmental Review

Arizona's On-line Environmental Review Tool
Search ID: 20061116001618
Project Name: Stateline Road
Date: 11/16/2006 1:43:00 PM

Project Location



Project Name: Stateline Road
Submitted By: Jean Charpentier
On behalf of: CONSULTING
Project Search ID: 20061116001618
Date: 11/16/2006 1:42:52 PM
Project Category: Transportation & Infrastructure,Road construction (including staging areas),Realignment/ new roads
Project Coordinates (UTM Zone 12-NAD 83): 682984.368, 3618243.034 meter
County: GREENLEE
USGS 7.5 Minute Quadrangle ID: 1559
Quadrangle Name: DUNCAN
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.

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
CH for Empidonax traillii extimus	Designated Critical Habitat for southwestern willow flycatcher				
CH for Xyrauchen texanus	Designated Critical Habitat for razorback sucker				

 APPLICATION INITIALS: _____

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
Fax 602-242-2513

Tucson Sub-Office
201 North Bonita, Suite 141
Tucson, AZ 85745
Phone 520-670-6144
Fax 520-670-6154

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

 APPLICATION INITIALS: _____

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),Realignment/ new roads

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.

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

 APPLICATION INITIALS: _____

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

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 initialed and signed 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

 APPLICATION INITIALS: _____

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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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.
5. A signed and initialed copy of the Environmental Review Receipt indicates that the entire receipt has been read by the signer of the Environmental Review Receipt.

Security:

The Environmental Review and project planning web application operates on a complex State computer system. This system is monitored to ensure proper operation, to verify the functioning of applicable security features, and for other like purposes. Anyone using this system expressly consents to such monitoring and is advised that if such monitoring reveals possible evidence of criminal activity, system personnel may provide the evidence of such monitoring to law enforcement officials. Unauthorized attempts to upload or change information; to defeat or circumvent security measures; or to utilize this system for other than its intended purposes are prohibited.

This website maintains a record of each environmental review search result as well as all contact information. This information is maintained for internal tracking purposes. Information collected in this application will not be shared outside of the purposes of the Department.

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.

Print this Environmental Review Receipt using your Internet browser's print function and keep it for your records. Signature of this receipt indicates the signer has read and understands the information provided.

Signature:_____

Date: _____

 APPLICATION INITIALS: _____

Proposed Date of Implementation: _____

Please provide point of contact information regarding this Environmental Review.

Application or organization responsible for project implementation

Agency/organization:_____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

Person Conducting Search (if not applicant)

Agency/organization:_____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

 APPLICATION INITIALS: _____