DRAFT
ENVIRONMENTAL ASSESSMENT

SAN CARLOS APACHE TRIBE
CENTRAL ARIZONA PROJECT
WATER EXCHANGE

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CHAPTER 1 - PURPOSE AND NEED

1.1 Introduction

The Bureau of Reclamation (Reclamation) has prepared this Environmental Assessment (EA) to analyze potential effects to physical, biological, and cultural resources that may result from the exchange of Central Arizona Project (CAP) water from the San Carlos Apache Tribe (Tribe) to the San Carlos Irrigation Project (SCIP). Under this proposal, the Tribe would retain up to 20,000 acre feet (af) of water in the San Carlos Reservoir (Reservoir) that otherwise would be discharged to the Gila River below Coolidge Dam.

The EA was prepared in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality regulations (40 CFR 1500-1508), and Reclamation NEPA Handbook. Reclamation is the lead Federal agencies pursuant to NEPA.

This document is organized into 6 chapters:

- *Chapter 1 - Purpose and Need:* Presents information on the history of the project proposal, the purpose of and need for the project, and the lead agency's proposal for achieving that purpose and need.
- *Chapter 2 - Comparison of Alternatives, including the Proposed Action:* Provides a detailed description of the lead agency's proposed action and no action. Mitigation measures are discussed in this chapter.
- *Chapter 3 - Environmental Consequences:* Describes the environmental effects of implementing the proposed action and no action. The analysis is organized by affected resource topic. Within each section, the affected environment is described first, followed by the effects of no action and the proposed action.
- *Chapter 4 – List of Preparers:* Lists preparers and agencies consulted during the development of the EA.
- *Chapter 5 – Environmental Laws and Directives:* Lists federal environmental laws and directives that are relevant to the project.
- *Chapter 6 - Literature Cited:* Lists documents used in the preparation of this EA.
- *Appendices:* The appendices provide more detailed information to support the analysis presented in the EA.

1.2 Background

Central Arizona Project. Congress passed the Colorado River Basin Project Act (CRBPA) on September 30, 1968. The CRBPA authorized the Secretary of the Interior (Secretary), acting through Reclamation, to construct the CAP to deliver Colorado River water for agricultural, industrial, and municipal uses in central and southern Arizona. The CAP, which was declared "substantially complete" in 1993, conveys Colorado River water through a 336-mile long system of pumping plants, aqueducts, dams, and reservoirs. CAP water is delivered through contracts negotiated between the Secretary

and Indian tribes, and subcontracts issued by the Central Arizona Water Conservation District to non-Indian agricultural districts and municipal entities.

In 1980, the Tribe signed a CAP Indian Water Delivery Contract with the United States for 12,700 af per year of CAP water. The Contract commits the United States to deliver the CAP allocation to the Tribe, and provides for exchange of CAP water as necessary to accomplish the contractual obligations. In order to settle water rights claims of the Tribe, Congress enacted the San Carlos Apache Tribe Water Rights Settlement Act of 1992, which added up to 51,445 af to the Tribe's original CAP allocation.[1] Because the San Carlos Apache Reservation lacks a direct connection to the CAP, the Tribe must rely on water exchanges with the San Carlos Irrigation and Drainage District (SCIDD) or the Gila River Indian Community (GRIC) to realize a beneficial use of its CAP water entitlement.

Constraints on Gila River Water Use. Congress authorized the construction of Coolidge Dam and creation of SCIP under the San Carlos Project Act of 1924. Storage of water began shortly after Coolidge Dam was completed in November 1928. Coolidge Dam is operated by the Bureau of Indian Affairs (BIA) in tandem with Ashurst-Hayden Diversion Dam and a network of canals to convey water from the Gila River to GRIC and SCIDD. These irrigation works comprise the BIA-managed SCIP. The Dam and San Carlos Reservoir are located on Federal land within the San Carlos Apache Reservation approximately 90 miles southeast of Phoenix (Figure 1).

In 1935, the U.S. District Court entered a consent decree, called the Globe Equity Decree (Decree), to settle disputes among users on the mainstem Gila River. The Decree quantified and established priority to the beneficial use of Gila River water, and created the position of Gila River Commissioner. Appointed by the U.S. District Court, the Gila River Commissioner manages the distribution of water to rights holders according to a call system. Under the Decree, GRIC and SCIDD can call up to 219 cfs and 192 cfs, respectively, based on the availability of natural flow within the river.[2] Water that is excess to these calls is stored behind Coolidge Dam by BIA for the sole purpose of meeting the irrigation demand of SCIP water users.

Prior to 1992, there was no intent established by the Decree or legislation that Coolidge Dam be operated for any purpose other than irrigation. However, the San Carlos Apache Water Rights Settlement Act of 1992 allows the Tribe to exchange its CAP water allocation in place of irrigation water releases from San Carlos Reservoir, and grants the Tribe permission to store exchanged water in the Reservoir to maintain a permanent pool for fish, wildlife, and recreation. All such water exchanges must be authorized by the Gila River Commissioner after consultation with other parties to the Globe Equity Decree, and are subject to approval by Reclamation acting on behalf of the Secretary.

[1] Includes the former annual CAP allocations of Globe (3,480 af), Phelps Dodge (14,665 af), and Ak-Chin (33,300 af).

[2] The Decree also granted the San Carlos Apache Tribe an annual entitlement of 6,000 af from the Gila River upstream of the Reservoir for irrigation of tribal farmland.

1.3 Purpose and Need for Action

The purpose of the exchange is to supplement the existing minimum pool of San Carlos Reservoir and avoid a possible fish kill that could result from acute drawdown. Drought in the upper Gila River watershed has limited the amount of water available for storage in the Reservoir, and in mid-May 2004 only 29,900 af, or 3 percent of maximum storage capacity,[3] was held behind Coolidge Dam. Approximately 20,500 af of the impounded water was acquired by the Tribe through exchange in previous drought years. This acquired water constitutes the existing minimum pool that cannot be released to downstream users. However, persistent low river flows coupled with water losses attributable to evaporation and percolation through lake-bottom substrates could deplete the Reservoir of sufficient volume to sustain the sport fishery, unless additional water is retained. Severe drawdown would have serious economic consequences for the Tribe and could create human health concerns from dead and decaying fish if a catastrophic fish kill ensues.

[3] Usable maximum storage capacity based on estimated sediment deposition is approximately 866,000 af.

CHAPTER 2 - DESCRIPTION OF ALTERNATIVES

2.1 No Action

In the absence of Federal approval of the proposed water exchange, no additional water would be retained in the Reservoir for the benefit of the sport fishery and recreation. The existing minimum pool would continue to decrease in volume through seepage and evaporation.

2.2 Proposed Action

The Tribe proposes to enter into an exchange agreement with SCIP water users to supplement the minimum pool in San Carlos Reservoir. Up to 20,000 af of the Tribe's annual CAP water allocation would be exchanged for an equal amount of Gila River water during 2004. This water would be retained by the Tribe and not released to the Gila River below Coolidge Dam. Water potentially available to the Tribe under the proposed exchange agreement consists of river flows entering the Reservoir in excess of water calls placed by GRIC and SCIDD, and water currently stored by SCIP behind Coolidge Dam. In mid-May 2004 approximately 9,000 af of the 29,500 af in the Reservoir was available for release to SCIP. The remaining 20,500 af constituted the minimum pool owned by the Tribe.

Under the proposed action, Reclamation would approve the CAP exchange and schedule CAP water deliveries to the downstream exchangers during 2004. The following actions must be completed before the CAP water could be acquired:

- The current availability of CAP water would have to be determined by working with CAWCD.
- The proposed exchange would have to be approved by the judge in the Globe Equity Court.
- SCIP-owned stored water must be available for exchange in the Reservoir.
- Agreements must be consummated with downstream users to accept exchange water during 2004.

2.3 Action Area

The action area encompasses the San Carlos Reservoir and a 68-mile reach of the Gila River between Coolidge Dam and Ashurst-Hayden Diversion Dam (Figure 2). San Carlos Reservoir is located within Pinal, Gila, and Graham Counties on the San Carlos Apache Reservation. The affected reach of river forms the boundary between Gila and Pinal counties from Coolidge Dam to the town of Hayden. Beyond Hayden the river continues through Pinal County to the Ashurst-Hayden Diversion Dam.

Figure 1

Figure 2

2.4 Mitigation and Monitoring

Recognizing that the proposed water exchange could affect listed species within the action area, Reclamation initiated formal consultation with the U.S. Fish and Wildlife Service (FWS) in October 2003 pursuant to Section 7(a)(2) of the Endangered Species Act (ESA). On March 8, 2004, the FWS issued a final biological opinion on the proposed exchange (FWS 2004). In its opinion, the FWS concluded that the water exchange would adversely affect, but not jeopardize the continued existence of the threatened bald eagle (*Haliaeetus leucocephalus*), the endangered southwestern willow flycatcher (*Empidonax traillii extimus*), and the threatened spikedace (*Meda fulgida*). The FWS also concluded that the action would not affect loach minnow (*Tiaroga cobitis*) or razorback sucker (*Xyrauchen texanus*), nor would it destroy or adversely modify spikedace or loach minnow critical habitat. In addition, the FWS concluded that the action may affect, but is not likely to adversely affect, the endangered cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*).

Reasonable and prudent measures were prescribed in consultation with the FWS to minimize the impacts of incidental take of the proposed action on southwestern willow flycatcher and bald eagle. These measures would be implemented by Reclamation. In addition, Reclamation is already involved in the recovery of spikedace and loach minnow, and regularly monitors for their presence in the Gila River between Coolidge Dam and the Ashurst-Hayden diversion.[4] The following reasonable and prudent measures are non-discretionary and must be implemented by Reclamation in order for an exemption from Section 7(a)(2) to apply:

- Implement steps to maximize the success of southwestern willow flycatcher territories in order to maintain "sites" that currently occur within the action area for metapopulation persistence. Steps include monitoring flycatcher nesting success at key sites along the Gila River during 2004, maintaining or enhancing flycatcher habitat at the Kearny site, and considering the use of cowbird traps on the Gila River to increase flycatcher productivity. Provide the FWS and BIA with a report at the end of the breeding season that documents flycatcher reproductive success.
- Investigate flow regimes appropriate to support southwestern willow flycatcher habitat from Coolidge Dam to Kelvin, including assessing the feasibility of supplementing flows downstream of the confluence of the Gila and San Pedro Rivers, and assessing the relationship among surface water flows, groundwater elevations, and flycatcher habitat.
- Monitor and improve foraging conditions during the 2004 reproductive season for the Coolidge Dam Breeding Area and Granite Basin Breeding Area bald eagles through a supplemental feeding program. Provide the FWS and BIA with a monthly report during the 2004 breeding season on the status of the Suicide,

[4] Continuation of loach minnow and spikedace surveys is a conservation recommendation in the biological opinion.

Coolidge Dam, San Carlos, and Granite Basin Breeding Area bald eagle pairs and eaglets.

- Monitor regional climatic conditions, predictive water supply forecasts, snowpack data, and SCIP's ongoing water orders to evaluate assumptions in the biological opinion relative to actual conditions in 2004.

CHAPTER 3 – ENVIRONMENTAL CONSEQUENCES

This chapter presents the existing conditions in the action area and the environmental consequences that can be expected from implementing the proposed action or no action.

3.1 Water Resources

3.1.1 Affected Environment

Water Supply. Water supply in San Carlos Reservoir is dependent on storm cycles that produce large, often flashy flows within the upper Gila watershed. Input from precipitation generally is distributed bimodally over the year, occurring during the winter months as a result of storms originating in the north Pacific Ocean, and during the summer monsoon season as result of convective thunderstorms which form from moisture drawn into the region from the Gulf of Mexico and Gulf of California (Sellers and Hill, 1974). In Arizona, the watershed drains approximately 7,430 square miles above the Reservoir. Agriculture is the major use of surface water in the upper watershed. Irrigation water is obtained by agricultural interests from alluvial wells near the channel and diversions of the river upstream from the Reservoir. The Gila River is intermittent where it enters the Reservoir.

Water discharged from Coolidge Dam flows approximately 68 miles down the Gila River to the SCIP-operated Ashurst-Hayden Diversion Dam. At the diversion, Gila River water is conveyed through the Florence-Casa Grande Canal to the Pima Canal. CAP water is turned out from the Fannin-McFarland Aqueduct and into the Pima Feeder Canal, which discharges into the Pima Canal. Surface water from the Gila River and CAP are subsequently blended in the Pima Canal with groundwater from wells located near the canal alignment. Both GRIC and SCIDD lands receive water from the Pima Canal. Exchanged Gila River water that is retained in the Reservoir is replaced by CAP deliveries to the Pima Canal.

Irrigation demand and the seasonal, flashy nature of river flows produce reservoir levels that can fluctuate dramatically from year to year. Flooding has filled the Reservoir to capacity 8 times in 5 years since storage began in 1928. Water levels have stayed above 50,000 af in 29 of the last 67 years, while drawdown to less than one percent of capacity has occurred in 27 years during the same period. Total dry-up of the Reservoir was recorded 21 times in 12 years between 1945 and 1972. A severe drawdown in 1990 was averted when Congress directed BIA to use SCIP power revenues to purchase 30,000 af of CAP water to exchange for reservoir water. Regional drought in 1997 and 1999 through 2003 required additional water exchanges with SCIP users to establish and conserve a minimum pool (see Appendix A).

Release of water from the Reservoir is dependent on irrigation demand, the availability of SCIP-owned stored water, and the amount of water flowing from the San Carlos and Gila

Rivers. Chronic drought since 1999 has severely reduced inflows to the Reservoir and depleted supplies of stored water available to downstream irrigators. On a seasonal basis, these effects are most pronounced in the weeks preceding the summer monsoon, when irrigation demand is high and natural river flow is low. Since February 2002, reservoir levels have been trending downward (Figure 3). In January 2004 the Reservoir dropped to its lowest level in 26 years.[5]

Figure 3. San Carlos Reservoir water levels - February 2002 to January 2004.

During recent drought years, natural river flow has been insufficient to meet irrigation demand (calls) between March and August. Total lack of natural river flow occurred frequently in May and July 2000, July 2001, June and July 2002, and June and July 2003 (USGS 2004). These low flow conditions are reflected in monthly mean inflow data shown in Table 1. Negligible releases from Coolidge Dam in June 1999, June and July 2000, and June and July 2002 resulted from depletion of SCIP-owned stored water, low natural river flows, and retention of exchanged water reserves in the Reservoir (Table 2).[6] Suspension of releases from Coolidge Dam to facilitate maintenance of SCIP structures also routinely dry up the Gila River below the Reservoir for several weeks during October and November each year.

[5] San Carlos Reservoir had a volume of 13,500 af on September 2 and 5, 1978.
[6] Minor river flows up to five miles below the Reservoir are sustained by leakage from the dam and from springs.

Table 1. Mean monthly inflows to San Carlos Reservoir from the Gila River.

Year	Mean Discharge (cfs)											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
1997	404	398	830	286	165	47	13	67	658	204	175	338
1998	348	480	1,364	1,224	459	109	114	97	31	30	134	200
1999	176	81	48	40	22	14	122	940	296	119	104	135
2000	156	84	47	35	8	2	4	42	15	1567	2468	438
2001	289	218	316	482	163	32	10	43	9	10	29	83
2002	150	84	52	33	13	<1	5	52	195	55	15	45
2003	71	157	224	184	93	11	8	<1	<1	*	*	*
1929-2002	742	711	717	402	220	52	78	295	240	345	229	444

Source: USGS Calva gage station (No. 09466500)
* Data not available

Table 2. Mean monthly flows in the Gila River below Coolidge Dam.

Year	Mean Discharge (cfs)											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
1997	133	228	653	512	537	661	829	507	68	140	1	160
1998	97	28	439	384	615	691	823	884	436	142	42	308
1999	73	160	355	156	251	1	47	322	125	85	2	169
2000	72	131	278	357	121	3	5	22	19	0.4	4	229
2001	41	123	404	463	544	628	705	462	270	204	1	258
2002	97	143	237	23	22	1	1	57	58	113	13	118
2003	73	152	327	218	96	8	33	1	1	*	*	*
1929-2002	430	387	502	463	381	440	527	554	340	188	104	275

Source: USGS gage station below Coolidge Dam (Station No. 09469500)
* Data not available

Water Quality. The Arizona Department of Environmental Quality (ADEQ) has reported exceedances of water quality standards for turbidity in most reaches of the upper Gila River in Arizona. High turbidity and bacteria counts were recorded at the Calva station above San Carlos Reservoir (ADEQ 2003). Irrigation return flows and mining have contributed to relatively high total dissolved solids values in river water entering the Reservoir (ADEQ 1995).

Exceedances of water quality standards for copper have occurred in the Gila River between Coolidge Dam and Ashurst-Hayden Diversion (ADEQ 2003). The FWS (1997) contaminants program recorded high levels of copper in Gila River sediment below the confluence of Mineral Creek.

Water quality problems in the Reservoir include periodic exceedances of bacteria, turbidity, ammonia, and dissolved oxygen standards (ADWR 2004). The high ammonia levels probably result from wastewater discharges and runoff from agricultural land (Reclamation 1998a). Dissolved oxygen depletion is problematic during drawdown when nutrients become concentrated, and total demand for oxygen by chemical and biological processes exceeds the oxygen input from aeration and photosynthesis (Figure

4). Circumstances that foster development of natural oxygen depletion include hot weather and low water levels (FWS 1990).

In general, severe drawdown during the warmest months of the year will appreciably lower dissolved oxygen concentrations of reservoir water. During summer months, decomposition of organic material produces anoxic conditions and relatively high hydrogen sulfide concentrations in cooler waters at the bottom of the Reservoir. When the reservoir volume is low, there is less oxygenated water in upper strata of the water column to buffer the effects of mixing by anoxic water with high hydrogen sulfide concentrations. These conditions can affect the fishery. Eighty percent of major fish kills in the Reservoir were recorded between May and October in years with low reservoir volumes (BIA 1998).

Figure 4. Dissolve oxygen concentration (mg/l) profiles during August 1992 (high water year) and August 1997 (low water year) in main body of the Reservoir (Reclamation 1998a).

3.1.2 No Action

In the absence of the proposed exchange, reservoir volume would drop below 19,000 af before the onset of the summer monsoon, assuming all SCIP-owned stored water is released to downstream irrigators.[7] Although storm runoff would be expected to stabilize or increase Reservoir levels by the end of the monsoon season, without the proposed exchange, any water stored in excess of the minimum pool would be subject to release to

[7] Average monthly water loss in the minimum pool between January 1 and May 13, 2004, was approximately 782 af.

SCIP. The minimum pool would likely drop below 14,000 feet by January 2005. This lower reservoir volume could adversely affect water quality and the fishery.

Hydrologic conditions below Coolidge Dam would improve during those periods when stored water is released to the river.

3.1.3 Environmental Consequences of the Proposed Action

Water Supply. Beginning in late May 2004, the Tribe would retain all inflow to the Reservoir in excess of calls up to 20,000 af for the remainder of the calendar year. An estimated 6,000 af to 8,000 af of SCIP-owned stored water immediately would be available for retention in the Reservoir. Although specific predictions regarding hydrologic conditions cannot be made for the remainder of 2004, persistent drought is expected to limit the supply of water available to SCIP users and the Tribe. In January 2004 the upper Gila River basin-wide average for snow water equivalent and total precipitation was 54 percent and 69 percent, respectively, suggesting spring runoff will be below normal. The National Weather Service seasonal outlook for Arizona indicates drought conditions will persist or intensify through July 2004 (NWS 2004).

Summer and early winter storms will afford the Tribe the greatest opportunity to retain excess river flow in the Reservoir during 2004. Very little if any retention beyond the amount acquired from SCIP storage would be expected during the relatively dry months of May through early July. Continuation of drought within the region increases the probability that the Tribe would acquire an amount substantially less than the desired 20,000 af.

The proposed action would incrementally worsen hydrologic conditions in the river during those times when SCIP-owned stored water would have been released. Without an available supply of stored water, discharges from Coolidge Dam would approximate natural flow. These flows likely would be negligible or nonexistent in June through mid-July if the drought persists.

Water Quality. The effect of the proposed action on water quality below Coolidge Dam is expected to be negligible. Under drought conditions, copper concentrations in river water would likely be lower due to reduced storm runoff from contaminant sources. Lower flow velocities and turbulence also would minimize potential release of copper from river sediments into the water column. The duration of low flows and dry-up in the river would be longer if the proposed action is implemented.

An increase in the volume of water retained in San Carlos Reservoir would increase the percent of aerated surface area. This would have a positive effect on dissolved oxygen levels in upper strata of the Reservoir.

3.2 Biological Resources

3.2.1 Affected Environment

Terrestrial Resources. San Carlos Reservoir is located at elevations ranging from approximately 2,400 to 2,500 feet and lies within the Arizona Upland Subdivision of Sonoran Desertscrub (Brown 1994) with species typical of the Creosote-Crucifixion-thorn series. Because of frequent changes in lake level, vegetation within the drawdown zone around the lake differs significantly from that above the maximum pool elevation (SWCA 1998). Vegetation in this area typically ranges from virtually none on recently exposed areas to low, dense stands of mostly exotic species such as saltcedar (*Tamarix* spp.), cocklebur (*Xanthium strumarium*), and Bermuda grass (*Cynodon dactylon*). A few patches of cattails (*Typha* sp.) are present in the San Carlos River arm of the Reservoir (SWCA 1998). Woody perennial riparian vegetation is absent along the edge of the Reservoir. Significant amounts of woody perennial riparian vegetation, including willow (*Salix* sp.), cottonwood (*Populus fremontii*), saltcedar, and mesquite (*Prosopis juliflora*) are present along the San Carlos and Gila Rivers upstream from the Reservoir.

Hunt et al. (1992) describe the riparian area below Coolidge Dam as lush, "and among the best riparian habitat inhabited by bald eagles in Arizona." The confluence of Hawk Creek (5 miles downstream of the dam) supports a cottonwood grove, with willows scattered along the banks. This riparian composition extends downstream on the Gila River until the river enters a constricted canyon where there is little or no floodplain to support dense stands of riparian habitat with the exception of locales such as the confluence of Dripping Springs Wash.

The confluence with the San Pedro River supports a relatively well developed cottonwood/willow community interspersed with saltcedar. Downstream of the confluence to the Ashurst-Hayden Diversion Dam, the riparian habitat is dominated by saltcedar in often large, homogenous patches. It is believed that the January 1993 flood scoured out much of the existing vegetation from Winkleman to Kelvin and inundated the banks on the higher benches of the Gila River. Mesquite is also present on some of these benches. Cottonwood, willow, saltcedar, and some mesquite can be found in the lower floodplain near the active channel.

Aquatic Resources. The nonnative sport fishery in the Reservoir includes channel and flathead catfish and largemouth bass, black crappie, and sunfish, which are stocked on an irregular basis by the Arizona Game and Fish Department (AGFD) working in conjunction with the FWS (BIA 1998). San Carlos Reservoir is noted for producing trophy catfish, crappie and bass. Severe drawdown of the Reservoir resulted in major fish kills in 1934, 1938 through 1940, 1946 through 1948, 1950 through 1957, 1960, 1961, 1965, 1976, and 1997 (BIA 1998). Figure 5 correlates annual low reservoir volumes with years in which major fish kills were reported.

Figure 5. Annual low reservoir volume for years in which major fish kills occur.

The stocking and bait bucket release of nonnative fishes in San Carlos Reservoir and other waters of the state has adversely affected the native fish community within the action area. Table 3 lists species that were documented in the Gila River in the vicinity of the formerly proposed Buttes Dam (1 mile upstream of Ashurst-Hayden Diversion Dam) in 1970 and those suspected on being present circa 1850 (Minckley 1972).

The AGFD, through a contract agreement with Reclamation, conducts annual surveys at various reaches of the Gila River downstream of Coolidge Dam as part of a reasonable and prudent alternative in the 1994 and 2001 biological opinions on the transportation and delivery of CAP Water to the Gila River Basin (Hassayampa, Agua Fria, Salt, Verde, San Pedro, middle and upper Gila Rivers, and associated tributaries) in Arizona and New Mexico. There are eleven routine sampling locations at different mileages upstream of Ashurst-Hayden Diversion Dam: Box O Wash (2.2 mile), Cochran (7.4 mile), Diamond A Ranch (17.3 mile), Kelvin (20.4 mile), Kearny (27.1 mile), San Pedro River (37.6 mile), O'Carroll Canyon (42.4 mile), Christmas (46.6 mile), Dripping Springs Wash (48.7 mile), Hook and Line Ranch (64.1 mile), and 0.5 mile below Coolidge Dam (68.7 mile). The fish fauna continues to be heavily dominated by nonnative species (Table 3).

Table 3. Fishes recorded in the Gila River Between Coolidge Dam and Ashurst-Hayden Dam.

Species	1850[1]	1970[1]	1991-2002[2]
Bonytail Chub (*Gila elegans*)	H		
Roundtail Chub (*Gila robusta*)	X		
Spikedace (*Meda fulgida*)	X		
Colorado Pikeminnow (*Ptychocheilus lucius*)	X		
Longfin Dace (*Agosia chrysogaster*)	X	X	X
Speckled Dace (*Rhinichthys osculus*)	X		
Loach Minnow (*Tiaroga cobitis*)	X		
Sonora Sucker (*Catostomus insignis*)	X		
Flannelmouth Sucker (*Catostomus latipinnis*)	X		
Desert Sucker (*Catostomus clarkii*)	X	X	X
Razorback Sucker (*Xyrauchen texanus*)	X		
Desert Pupfish (*Cyprinodon macularius*)	H		
Gila Topminnow (*Poeciliopsis o. occidentalis*)	H		
Black Bullhead (*Ictalurus melas*)		*	X
Yellow Bullhead (*Ictalurus natalis*)		*	X
Channel Catfish (*Ictalurus punctatus*)		*	X
Common Carp (*Cyprinus carpio*)		*	X
Red Shiner (*Cyprinella lutrensis*)			X
Threadfin Shad (*Dorosoma petenense*)		*	X
Mosquitofish (*Gambusia affinis*)		*	X
Green Sunfish (*Lepomis cyanellus*)		*	X
Bluegill (*Lepomis macrochirus*)		*	X
Largemouth Bass (*Micropterus salmoides*)		*	X
Smallmouth Bass (*Micropterus dolomieu*)			X
Fathead Minnow (*Pimephales promelas*)		*	X
Black Crappie (*Pomoxis nigromaculatus*)			X
White Crappie (*Pomoxis annularis*)		*	
Flathead Catfish (*Pylodictis olivaris*)		*	X

X= presence as documented by on-site or upstream literature, photographic, or specimen records
H= probable occurrence based on known ecology of the species and habitats in the area
*= suspected as being present in the vicinity of the formerly proposed Buttes Dam (Minckley 1972)
[1] Source: Minckley 1972
[2] Source: Reclamation 2002

Status of Listed Species in the Action Area. A total of 19 species listed as threatened, endangered, or proposed for listing by the Service were identified in Gila and Pinal counties (Table 4). Of these, six were considered by Reclamation as being potentially affected by the proposed exchange: bald eagle, southwestern willow flycatcher, cactus ferruginous pygmy-owl, spikedace, loach minnow and razorback sucker.

Table 4. Federally-listed and proposed species in Gila and Pinal Counties (Arizona Ecological Services Homepage; http://arizonaes.fws.gov).

Species	Listing Status
Plants	
Arizona Hedgehog Cactus (*Echinocereus triglochidiatus* var. *arizonicus)*	E
Nichol's Turk's Head Cactus (*Echinocactus horizonthalonius* var. *nicholii)*	E
Fish	
Apache Trout (*Oncorhynchus apache)*	T
Gila Trout (*Oncorhynchus gilae)*	E

Gila Topminnow (*Poeciliopsis occidentalis)*	E
Gila Chub (*Gila intermedia*)	PE
Spikedace (*Meda fulgida*)	T
Colorado Pikeminnow (*Ptychocheilus lucius*)	E,EXPN
Loach Minnow (*Tiaroga cobitis*)	T
Razorback Sucker (*Xyrauchen texanus*)	E
Desert Pupfish (*Cyprinodon macularius*)	E
Amphibians	
Chiricahua Leopard Frog (*Rana chiricahuensis)*	T
Birds	
Bald Eagle (*Haliaeetus leucocephalus)*	T
Brown Pelican (*Pelecanus occidentalis)*	E
Cactus Ferruginous Pygmy-Owl (*Glaucidium brasilianum cactorum)*	E
Mexican Spotted Owl (*Strix occidentalis lucida)*	T
Southwestern Willow Flycatcher (*Empidonax traillii extimus)*	E
Yuma Clapper Rail (*Rallus longirostris yumanensis)*	E
Mammals	
Lesser Long-Nosed Bat (*Leptonycteris curasoae yerbabuenae)*	E

E= Endangered, T=Threatened, EXPN=Experimental, P=Proposed

Bald Eagle. In 1978 all bald eagles in 43 of the 48 contiguous United States, including Arizona, were classified as endangered (43 FR 6233) and those in Minnesota, Wisconsin, Michigan, Oregon, and Washington were classified as threatened. No critical habitat was designated for this species as it occurs across a broad range of habitats. As part of the listing package, the lower 48 states were divided into five regions to establish regional goals for recovery. Arizona fell into the Southwestern Recovery Region with New Mexico and the western parts of Texas and Oklahoma. On July 12, 1995, the FWS downlisted the bald eagle to threatened (60 FR 36000), and on July 6, 1999, proposed a rule to remove the bald eagle in the lower 48 states from the endangered species list altogether (64 FR 36454).

The bald eagle is a large fish eating raptor once found throughout North America near seacoasts, lakes, and rivers. Population levels prior to European settlement were estimated to reach 500,000 individuals, but have since declined to only about 4,500 (64 FR 36454). Chemical contamination (chiefly organochlorine pesticides such as DDT and its metabolite DDE) caused severe population declines and local extirpation throughout the species' range through reproductive failure and direct toxicity. Habitat loss, persecution, and disturbance also threaten the bald eagle's existence and continued recovery.

Although not considered a separate subspecies, bald eagles in the southwest are considered a biologically isolated population for purposes of recovery efforts and ESA Section 7 consultation. Most bald eagles nest in trees near bodies of water. However, Arizona's bald eagles frequently nest on cliffs and pinnacles. Bald eagles in Arizona also nest earlier, laying eggs in January or February and fledging young in May. This may be a behavioral adaptation to avoid the extreme desert heat of midsummer. The young eagles remain in the vicinity of the nest for about 45 days after hatching (Hunt et al. 1992).

There are five bald eagle territories or Breeding Areas (BA) in the action area that could potentially be affected by the proposed action. Three pairs exist on the Gila River (Coolidge, Granite Basin, Winkleman BAs), one on the San Carlos River (San Carlos BA), and one on the Reservoir near Coolidge Dam (Suicide BA). The AGFD conducts annual Occupancy and Reproductive Assessment flights to determine the status of breeding attempts.

The Coolidge BA was discovered in 1985 and is located approximately 5 miles downstream from Coolidge Dam at the confluence of Hawk Canyon. The confluence supports a cottonwood grove, with willows scattered intermittently along the banks. The cottonwoods are in a state of senescence, and little regeneration has been observed. The Coolidge eagles have also nested on a cliff downstream of Hawk Canyon but consistently use two nests in the cottonwood grove. Between 1985 and 2003, this BA was reproductively successful in fledging 14 young in 19 years (0.74 young per occupied year). There are currently 2 eaglets in the nest approximately 7 weeks old. It is anticipated that they will fledge in 5 more weeks (pers. comm. 13 May, 2004, James Driscoll, Arizona Game and Fish Department). Data on the foraging ecology of the Coolidge pair is limited. However, they are known to forage on the Gila River below Coolidge Dam as well as on the Reservoir (Hunt et al. 1992).

The Suicide BA was discovered on a cliff face near the dam on the Reservoir in 1998. Between 1999 and 2003 the pair has been reproductively successful, fledging 10 young in 5 years (2.0 young per occupied year). There are currently 3 eaglets in the nest approximately 10 weeks old. It is anticipated they will fledge in 2 more weeks (pers. comm.. 13 May, 2004, James Driscoll, Arizona Game and Fish Department). Data on foraging patterns of this pair is not available, but it is assumed that they forage on the Reservoir as they nest less than ½ mile upstream of the dam with a commanding view of the Reservoir. This would give these eagles a strategic advantage, especially during periods when the Reservoir surface area is low.

The Granite Basin BA was discovered in 1999 near Granite Basin. The nest is on a large pinnacle on the left bank of the Gila River about 10 miles downstream of Coolidge Dam. The pair has failed to produce young, although they have laid eggs twice in 5 years (1999 and 2001). The BA was unoccupied in 2004. Although no information exists on foraging habitats, it is believed this pair exclusively uses the Gila River for foraging.

The San Carlos BA was first discovered in 1995 near the town of Peridot. The eagles nest in a large cottonwood grove upstream on the San Carlos River inflow to the Reservoir, and closer to the inflow on a large sand cliff. Between 1995 and 2003, young have successfully fledged in 9 years (0.67 young per occupied year). There is currently one eaglet in the nest which could fledge at anytime (pers. comm.. 13 May, 2004, James Driscoll, Arizona Game and Fish Department). Although no foraging studies have been conducted, the San Carlos pair likely depends on the Reservoir, and to a lesser extent the San Carlos River for food.

The reproductive and occupancy history of these BAs is outlined in Table 5. In 2003, the Granite Basin and San Carlos BAs were occupied by bald eagles, but they did not lay eggs or produce any young. The Winkleman BA was unoccupied as it has been since 1999 (the pair has subsequently been sighted at other BAs in Arizona). The Coolidge BA successfully fledged one young on June 25 and the Suicide BA fledged three young between May 20 and 22, 2003.

Table 5. Reproductive and occupancy history of bald eagle breeding areas within the action area (personal communication Kenneth Jacobson, AGFD, September 24, 2003).

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Coolidge	F	S	S	S	O	O	S	S	S	F	S	F	S	F	F	F	F	F	S
Granite Basin															F	O	F	O	O
San Carlos											S	S	F	S	O	F	O	F	O
Suicide															S	S	S	F	S
Winkelman											O	F	F	O	U	U	U	U	U

F = failed
O = occupied
S = successful

Cactus Ferruginous Pygmy-Owl. The subspecies of ferruginous pygmy-owl (pygmy-owl) found in Arizona was listed as endangered on March 10, 1997 (62 FR 10730). Critical habitat for the species was designated on July 12, 1999 (64 FR 37419). On September 19, 2001, critical habitat designation was remanded back to the Service for further review. A proposed rule to designate critical habitat was again published on November 27, 2002 (67 FR 71032). However, the Final Rule designating critical habitat for the Arizona population has been vacated.

The pygmy-owl is the rarest and one of the smallest owls in Arizona. Fully grown owls weigh about 2 ½ ounces and stand only 6 ¾ inches in height. Pygmy-owls are most active at dawn and dusk and feed on a variety of prey including small mammals, reptiles, birds, and insects.

Records have shown that pygmy-owls utilized cottonwoods and willows for nesting in riparian woodlands (Rea 1983). However, recent records have documented pygmy-owls in a variety of vegetation communities such as riparian woodlands, mesquite (*Prosopis velutina* and *P. glandulosa*) bosques, Sonoran desertscrub, semidesert grassland, and Sonoran savanna grassland communities (67 FR 71032).

The 1999 critical habitat proposal included the confluence of the San Pedro and Gila Rivers and a further downstream reach of the Gila River. However, in 2002, this area was deleted because of the lack of recent, verified locations and the inability to determine the presence of the primary constituent elements (67 FR 71038).

Several factors may all have played a role in the decline of the pygmy-owl in Arizona. Peripheral populations may be inherently unstable. After periods of environmental

harshness, bird population abundance may decline in proportion most significantly at the edge of the range (Mehlman 1997). The reduction in stream flow below the large dams in Arizona, coupled with historical episodes of arroyo cutting, channel changes, and loss of riparian vegetation resulted in "desertification" of rivers and loss of prime riparian pygmy-owl habitat (Johnson et al. 2003)

For the purposes of determining whether or not to conduct surveys for pygmy-owls, the FWS has provided guidance on what it believes may be potentially suitable habitat. Suitable habitat for the pygmy-owl is defined as areas below 4,000 feet in elevation containing one or more of the following vegetation communities:

- *Riparian vegetation*: broadleaf, riparian gallery forests of cottonwood, willows, mesquites, ash, or other trees growing along watercourses and associated species.

- *Sonoran desertscrub*: characterized by braided wash systems and vegetation which are dense and well structured. Key species include mesquite, foothill and blue palo verdes, ironwood, saguaro, organ pipe cactus, and various other shrubs and cacti.

- *Semidesert grasslands*: containing wooded drainages with mesquite, hackberry, ash, and a limited number of saguaros.

Vegetative communities listed above containing saguaro cactus or other columnar cactus that are 8 feet or taller, or ironwood, mesquites, palo verde or other large trees with a trunk diameter of 6 inches or greater measured at 4.5 feet above the ground may provide nesting opportunities for pygmy-owls (FWS 2000).

Since the AGFD initiated surveys for pygmy-owls in 1990, population numbers have ranged from a low of 1 pygmy-owl in 1990 to a high of 78 (including juveniles) in 1999 (SDCP 2001A and 2001B). There have been 20+ adult pygmy-owls recorded in the Tucson area for the past 3 survey years (1999-2001). Numbers in 2002 dropped to 15 birds (public meeting, January 23, 2003). In 2003, there were 21 adult and 16 fledglings documented from the Tucson area, the Altar Valley, and Organ Pipe Cactus National Monument (personal communication Scott Richardson, Service, October 8, 2003). No pygmy-owls have been recorded in the action area.

Southwestern Willow Flycatcher. The flycatcher was listed as endangered, effective March 29, 1995 (60 FR 10694). Designation of critical habitat was deferred at the time of listing. A final critical habitat designation was made on July 22, 1997 (62FR39129) with a correction on August 20, 1997 (62 FR 44228). On May 11, 2001, the 10th Circuit Court of Appeals remanded the critical habitat designation and instructed the Service to issue a new designation in compliance with the Court's ruling. The U.S. District Court recently ruled that the Service must re-propose critical habitat within a year (Memorandum Opinion, U.S. District Court, New Mexico, September 1993). The final Southwestern Willow Flycatcher Recovery Plan was released on March 5, 2003.

The flycatcher is an insectivore, catching insects while flying, hovering to glean them from foliage, and occasionally captures insects on the ground (FWS 2002). Flycatchers forage within and above the canopy, along the patch edge, in openings within the territory, above water, and glean from tall trees as well as herbaceous ground cover. Diet studies of adult flycatchers found a wide variety of prey taken (Drost et al. 1997, DeLay et al. 2002). Major prey items were small (flying ants) to large (dragonflies) flying insects, with Hymenoptera, Diptera and Hemiptera (true bugs) comprising half of the prey items (FWS 2002).

The flycatcher usually breeds in patchy to dense riparian vegetation along streams or other wetlands, near or adjacent to surface water, or underlain by saturated soils. Common tree and shrub species comprising nesting habitat include willows (*Salix* spp.), seepwillow (*Baccharis* spp.), boxelder (*Acer negundo*), stinging nettle (*Urtica* spp.), blackberry (*Rubus* spp.), cottonwood, arrowweed *(Tessaria sericea*), saltcedar, and Russian olive (*Eleagnus angustifolia*) (FWS 2002). Habitat characteristics and parameters can vary over the geographical range of the species. However, regardless of the plant species composition or height, occupied sites usually consist of dense vegetation in the patch interior, or an aggregate of dense patches interspersed with openings; in most cases this dense vegetation occurs within the first 10 to 13 feet above ground. These dense patches are often interspersed with small openings, open water, or shorter/sparser vegetation, creating a mosaic that is not uniformly dense (FWS 2002).

As a general rule, flycatcher territories are seldom farther than a few dozen meters from water or saturated soil (Finch and Stoleson eds. 2000). However, hydrological conditions at a site can vary considerably within a season and between years. At some sites, particularly during drought years, water or saturated soil is only present early in the breeding season (i.e. May and part of June). At other sites, vegetation may be immersed in standing water during a wet year, but be hundreds of meters from surface water in dry years (Finch and Stoleson eds. 2000).

Declines in the distribution and abundance of flycatchers in the Southwest are attributed to habitat loss and modification, caused by impacts of dams and reservoirs, diversions and groundwater pumping, channelization and bank stabilization, phreatophyte control, livestock grazing, recreation, fire, agriculture development and urbanization (FWS 2002).

In 1993, limited flycatcher surveys coordinated by the AGFD were conducted on the lower San Pedro River and Gila River (action area). No birds were detected on the Gila River until 1994 when one territory was documented at Kearny (Paradzick et al. 2001). In surveys conducted by the AGFD in 1996, eight territories were found between Winkelman and the Ashurst-Hayden Diversion Dam. As a result of increased survey efforts and possible population increases, the number of flycatchers increased to 68 territories in 1999. However, the number of territories has declined since then to 26 in 2003 (Table 6). The surveys conducted on the lower San Pedro River and the Gila River downstream of the San Pedro River confluence are being funded by Reclamation as part

of a reasonable and prudent alternative in a biological opinion on the modifications to Roosevelt Dam. These surveys will continue until 2006.

Table 6. Number of southwestern willow flycatcher territories on the Gila and San Pedro Rivers (1994-2003), Arizona (Paradzick et al. 2001, Smith et al. 2002, Smith et al. 2003, AGFD unpubl. data).

Year	Number of Territories	
	Gila River	San Pedro River
	Winkelman to Ashurst-Hayden Dam	Wheatfields to Winkelman (Soza Wash to Winkelman)
1994	Unknown	44
1995	Unknown	32
1996	8	29
1997	33	43
1998	48	44 (46)
1999	68	65
2000	52	67
2001	40	75 (78)
2002	46	129(144)
2003	26	91(139)

Only 6 of 17 Recovery Plan flycatcher sites (geographic units surveyed by the AGFD) on the Gila River are currently occupied (Table 7). During the peak year of 1999, 12 of these Recovery Plan sites on the Gila River were occupied.

In the reach of the Gila River between Winkelman and Kelvin, the flycatcher breeds in patchy to dense riparian habitat near surface water in the lower floodplain or on elevated benches. Nests have been found in saltcedar, willow, and cottonwoods.

Only three sites in the project area are classified as native-species dominated averaging approximately 20 percent saltcedar (GIGN04, GIGN09, GIGS12) (Paradzick personal communication 2003 and unpublished data). The remaining currently occupied sites are saltcedar dominated, averaging approximately 40 percent saltcedar (Paradzick personal communication 2003).

The habitat occupied by the flycatchers, now about 10 years old (post 1993 flood), may also be mature and declining in suitability. This phenomenon has been speculated as occurring at older habitat at Roosevelt Lake. Over-flights conducted by Reclamation and FWS biologists in 2002 and 2003, and observations by AGFD flycatcher survey crews documented areas where saltcedar, cottonwoods, and willows are stressed and/or have died. It is likely that this is the result of the general drought conditions exacerbated by diminished or loss of flows in the Gila and San Pedro River. Groundwater tables at the Kearny Sewage Pond site may also be affected by pumping from the town of Kearny.

Table 7. Number of territories at flycatcher sites on the Gila River between Coolidge Dam and Kelvin, Arizona (AGFD unpubl. data, Paradzick et al. 2001, Smith et al. 2002, Smith et al. 2003).

Recovery Plan Site Code (AGFD Site Code)	Number of Willow Flycatcher Territories							
	1996	1997	1998	1999	2000	2001	2002	2003
GIGN20 (GRN020)	2	2	2	5	0	0	0	0
GIGN18 (GRN018)	-	2	2	5	4	9	7	5
GIGS18 (GRS018)	-	1	1	4	4	2	7	5
GIGS15 (GRS015)	-	1	1	1	1	0	0	0
GIGN15 (GRN015)	-	-	-	-	1	0	0	0
GIKRNY (Kearny)	6	8	25	23	19	14	14	9
GIGS13 (GRS013)	-	1	0	0	0	-	0	-
GIGS12 (GRS012)	-	4	6	8	7	5	3	1
GIGN11 (GRN011)	-	2	0	0	0	-	-	-
GIGS11 (GRS011)	-	0	0	1	2	1	1	0
GIGN10 (GRN010)	-	5	4	4	2	1	1	0
GIGS10 (GRS010)	-	3	0	4	0	0	0	-
GIGN09 (GRN009)	-	0	0	0	0	1	2	0
GIGN08 (GRN008)	-	0	0	0	0	0	2	0
GIGS07 (GRNS007)	-	3	6	11	10	5	7	5
GIGN04 (GRN004)	-	1	1	2	2	2	2	1
GISPRG (Dripping Springs Wash)	-	-	0	1	0	-	0	0
TOTAL	8	33	48	69	52	40	46	26

Boxes marked with ?-? indicate no surveys conducted in that year.

The Gila River between Coolidge Dam and Phoenix is within the Middle Gila/San Pedro Management Unit in the Gila Recovery Unit (FWS 2002). The Recovery Plan established the minimum number of territories needed for reclassification to Threatened status for each Management Unit. This Management Unit has a goal of 150 territories. At the time the Recovery Plan was prepared, 120 territories were documented within this Management Unit (FWS 2002). This is one of the most important and largest populations of flycatchers in the Southwest. Although most flycatchers within this Management Unit are concentrated along the lower San Pedro River, the Gila and San Pedro River flycatchers are considered one contiguous population. The number of flycatchers in the Middle Gila/San Pedro Management Unit continues to increase, with at least 165 territories documented in 2003 (AGFD unpublished data). This increase can be attributed to habitat improvement along the lower San Pedro River through natural regeneration following the 1993 flood, livestock and off-highway vehicle control, and a reduction in agriculture.

As part of the Reasonable and Prudent Alternative in the biological opinion for the modifications to Roosevelt Dam, flycatchers were banded in part to determine movements between breeding areas. In 2001, a flycatcher banded as a nestling in 1999 from the Kearny Sewage Ponds was recaptured at Roosevelt Lake (Kenwood and Paxton 2001). This and other data supports the contention that flycatchers can successfully disperse to other breeding populations as well as move within the same population. It is believed that as the habitat quality on the Gila River declines, some of these birds will disperse to other more suitable habitat on the lower San Pedro River, Roosevelt Lake, and the Verde River.

An unknown number of flycatchers occur on the Gila River mainstem just upstream of the Reservoir. This area is on Tribal lands and the data is considered privileged information. The extent, duration, and survey results may only be released with the consent of the Tribe.

Spikedace. The Service listed the spikedace as Threatened in 1986 (51 FR 23769). The Gila River from the confluence of the San Pedro River to Ashurst-Hayden Diversion Dam was designated as Critical Habitat in 2000 (50 FR 24328). A Recovery Plan was completed in September 1991.

This fish was considered common throughout much of the Gila River drainage above Phoenix, including the Gila, Verde, Agua Fria, Salt, San Pedro, and San Francisco Rivers in Arizona. Today, populations in Arizona are restricted to Aravaipa Creek, Eagle Creek, and a portion of the upper Verde River. Habitat destruction and competition and predation from introduced nonnative fish species are the primary causes of the species' decline.

Spikedace appear to prefer moving water less than a meter in depth during most of the year, concentrating near the downstream ends of riffles, or in eddies. In larger habitats, such as in the Salt River Canyon, spikedace have been taken only below the mouths of creeks, and as young along the margins of large pools over muddy bottoms. In spring, the fish frequents fairly shallow areas, especially over sand and finer gravels in places of swift, relatively laminar flow (Minckley 1973).

A single record (1991) of spikedace exists from the middle Gila River upstream from Ashurst-Hayden Diversion Dam. It is unknown whether this was a vagrant washed downstream from the extant population on Aravaipa Creek or is indicative of another population on the Gila River. Limited fish surveys have been conducted on the Gila River below the confluence with the San Pedro River since 1991, in part an element of the Reasonable and Prudent Alternative in the Biological Opinion on the transport of CAP water into the Gila River Basin. No spikedace have been recorded during these surveys. The high predator load in this reach of the Gila River likely precludes a viable population of spikedace.

Loach Minnow. The loach minnow was listed as threatened by the Service on October 28, 1986 (51 FR 39468). Critical Habitat was designated on April 2000 (50 FR 24328), and includes portions of the Gila, San Francisco, Blue and Tularosa Rivers, and Aravaipa, Campbell Blue, and Dry Blue Creeks. The Gila River from the confluence of the San Pedro River to Ashurst-Hayden Diversion Dam is designated critical habitat. A Recovery Plan was completed in 1991.

The fish was once considered common throughout much of the Gila River system north of Phoenix, including the Gila, Blue, Tularosa, White, Verde, Salt, San Pedro, and San Francisco Rivers in Arizona and New Mexico. Loach minnow are now found in only seven locations: Aravaipa Creek, the upper Gila, San Francisco and Tularosa Rivers in

New Mexico, the north fork of the East Fork of the Black River, the White River, and the Blue River. Habitat destruction and competition and predation from introduced nonnative fish species are the primary causes of the species' decline.

This is a highly specialized species that is essentially restricted to gravelly riffles in smaller to moderately large creeks and rivers. It most often is taken in association with beds of filamentous algae either in the main channels of shallow, swift reaches, or along the margins of more torrential rapids.

No loach minnow have been documented from known surveys on the Gila River downstream of Coolidge Dam. The high predator load in this reach of the Gila River likely precludes a viable population of loach minnow.

Razorback Sucker. The razorback sucker was listed as endangered on October 23, 1991 (56 FR 54957). Critical habitat was designated for this species on March 21, 1994(59 FR 13379). In Arizona, critical habitat includes the Gila River from the New Mexico border downstream to Coolidge Dam (including San Carlos Reservoir), most of the Colorado River, and parts of the Salt and Verde Rivers.

The razorback sucker is endemic to the Colorado River Basin. It formerly occurred in all major rivers and larger streams in the basin and was once the most widespread and abundant of the basin's "big-river" fishes. Razorback suckers completely disappeared from the Gila River by 1960 (Hendrickson 1993). Today, populations in the Lower Basin are found in lakes Mohave, Havasu, and Mead, and the lower Colorado River below Lake Havasu.

Alteration of river conditions and loss of habitat caused by dam construction, irrigation de-watering and channelization as well as introduction of non-native species are the main reasons for the decline of this fish.

From 1981 to 1990, more than 12 million larval and juvenile razorback suckers were stocked into historic habitats in Arizona and California (Hendrickson et al. 1993). No populations of razorbacks appear to have been established in any areas where they were re-introduced and little evidence has been found of individuals persisting for more than a few months (SWCA 1998). Predation by non-native fishes such as channel catfish and large-mouthed bass are likely the primary cause of this failure (Marsh and Brooks 1984, Minckley et al. 1991). More than 1,100,000 razorback suckers were re-introduced into the Gila River and its tributaries upstream of San Carlos Reservoir(Hendrickson 1993).

Adult razorback suckers utilize both quiet backwater areas and river channel habitats. Radio telemetry on adults released into the Verde River showed that the fish used pools and other slow water areas and avoided riffles (Clarkson et al. 1993). Telemetry studies from other locations have shown that some razorback suckers will make extensive up and downstream movements while others remain in the same immediate area. Both main channel and quiet water habitats are used.

It is possible that some razorback suckers introduced into the Gila River migrated into San Carlos Reservoir. However, we consider this to be highly unlikely due to the presence of non-native fishes in the Gila River and especially in the Reservoir. Fishery surveys of the Reservoir, although not conducted specifically for razorback sucker, have been negative (pers comm. Stuart Leon 2003). The possibility of successful reproduction by these fish is thought to be extremely low (Paul Marsh pers. comm. 1997, in SWCA 1998). There is also an extremely low probability of occurrence in the Gila River downstream of Coolidge Dam due to nonnative fishes.

Critical habitat for a listed species consists of (1) specific areas within the geographical area currently occupied by a species, at the time it is listed, in accordance with the provisions of Section 4 of the Endangered Species Act, on which are found those physical or biological features (i) essential to the conservation of the species, and (ii) that may require special management considerations or protection, and (2) specific areas outside the geographical area occupied by a species at the time it is listed in accordance with the provisions of Section 4 of the Endangered Species Act, upon a determination by the Secretary (Interior) that such areas are essential for the conservation of the species (FWS 1998). San Carlos Reservoir is designated critical habitat for the razorback sucker, and data indicates that adult razorbacks can survive in reservoir habitats. The Service has also stated that habitat for the razorback is protected regardless of the reservoir pool elevation (59FR: 13394, March 21, 1994). However, Reclamation believes that the available data strongly suggest that razorbacks are not present in the Reservoir. As such, the Reservoir can be considered as unoccupied critical habitat.

3.2.2 No Action

Protracted drought would be additive to other factors that adversely influence river flow and Reservoir levels. Conditions for southwestern willow flycatchers and bald eagles below Coolidge Dam are improved during periods when stored water is released to the river or natural flow is high. Productivity among bald eagles that use the prey base associated with the Reservoir could be affected if drawdown produces a significant fish kill.

3.2.3 Environmental Consequences of the Proposed Action

Bald Eagle. An analysis of bald eagle productivity with lowering lake levels indicated a declining trend in productivity from 1993 to 2001 on regulated reservoirs in Arizona (SRP 2002). However, the sample size in this analysis was small and the bald eagle ecology at the lakes included in the analysis could be significantly different. Productivity in raptor populations frequently is density dependent, and as the population of nesting pairs increases, the brood size and nest success commonly decreases (Newton 1979).

A similar phenomenon may be taking place at San Carlos Reservoir. The number of bald eagle nesting territories at the Reservoir increased from one in 1985 to three in 1999. Prior to 1995, the eagles from the Coolidge BA had sole access to the Reservoir and its fish and waterfowl forage base. In 1995, the San Carlos BA was discovered, and it

appears as if both breeding areas were able to coexist and be reproductively productive. Reservoir storage in 1995 was high, with volumes ranging from 440,100 af in January to 807,300 af in June.

However, with the establishment of the Suicide BA in 1999, productivity of the San Carlos and Coolidge BAs dropped to nearly zero. Reservoir storage volume was significantly lower in 1999 compared to 1995. The Suicide BA nest is located about ½ mile upstream of the dam and has a commanding view of the Reservoir giving these eagles easy access to the Reservoir with a minimal amount of energy expenditure. They also have perches from which to hunt for fish and waterfowl that are not accessible to other eagles further upstream. The bald eagles from both the San Carlos and Coolidge BAs would have to expend energy flying to and from the Reservoir to forage. As water levels decease, these eagles would come into increasing contact and conflict with the Suicide bald eagles. It is the opinion of the AGFD that both the Suicide and San Carlos bald eagles would actively defend this limited foraging habitat from intrusions by the Coolidge pair (personal communication James Driscoll, AGFD, 28 March, 2002).

Decreasing reservoir water levels and the increasing probability of conflict with bald eagles from two BAs would increase the importance of the Gila River as foraging habitat for the Coolidge BA bald eagles. Prey analysis of the Coolidge BA conducted by Biosystems, Inc., (Hunt et al. 1992) indicated that fish made up about 50 percent of the diet with the remainder of the prey items about evenly split between birds and mammals. The importance of these other prey items increased when the percent of biomass was calculated. Although data on the foraging ecology of these eagles is not available, Hunt et al. (1992) believed that the regulated flows of the Gila River support an important fishery for this pair.

As noted in Table 5, before the establishment of the Suicide BA, both the Coolidge and San Carlos BAs had been relatively successful. Since the appearance of the Suicide BA in 1999, and the decreased surface area on the Reservoir, both of these BAs have failed to produce young until 2003 when the Coolidge BA successfully fledged one young (a second eaglet apparently died of dehydration).

Without the use of radio-telemetry or intensive monitoring, data on the foraging ecology and inter-relationship of the Breeding Areas will continue to be limited .

Both the Winkelman and Granite Basin BAs were unoccupied in 2004 and the proposed exchange should have no impact on these eagles. The San Carlos BA eaglet should be fledged by the time the exchange is anticipated to go into effect (sometime after May 24) and the three eaglets in the Suicide BA should fledge sometime immediately after that date. It is anticipated that there would be no impact to these eagles from the proposed action and that retention of water in the Reservoir may actually enhance the survivability of those birds through the 45 days when they will still rely on the adults for food and through migration. However, the Coolidge BA young will still be in the nest and susceptible to any consequences resulting from a reduction in flows downstream of the Dam.

The FWS biological opinion recognized that the proposed action could reduce access and availability of food to the Coolidge BA eagles by eliminating critical shallow, fast moving riffles in the Gila River necessary for foraging. As a consequence of these direct effects, the FWS was reasonably certain that take would occur at this BA in the form of harm through failure to produce eggs or young. The take, however, would not rise to the level of jeopardy.

The terms and conditions in the biological opinion for the reasonable and prudent measure for the bald eagle required that Reclamation provide food to the adult Coolidge BA eagles to improve their foraging opportunities. It was anticipated that the supplemental feeding would occur during March. Reclamation has already funded the Arizona Nestwatch Program to monitor the status of the Coolidge BA and to reduce the impacts from other sources of disturbance.

However, the proposed action would be implemented later in the breeding season with the eaglets several weeks away from fledging. If the proposed action is not implemented until after May 25, 2004, it is possible that there would be an impact to the ability of the Coolidge BA eaglets to successfully fledge and survive to migrate north. However, given the lack of data on foraging ecology, the current and immediate future forage base in the river, and the synergy between natural flows, the effects of the proposed action, and the flows below the Dam, we feel it is not possible to quantify this impact. In the worst case, the impact would be no greater than that concluded by the FWS in their March 2004 biological opinion, which Reclamation has accepted and committed to implement.

Cactus Ferruginous Pygmy-Owl. Pygmy-owls have not been documented within the action area; either historically or in the present. Limited surveys of the Gila River between Kelvin and Ashurst-Hayden Diversion Dam were conducted by the AGFD in 2002 and 2003 with negative results (personal communication Scott Richardson, Service, October 6, 2003). Although dense saltcedar thickets would not be used for nesting by pygmy-owls, they could use the edges and openings for foraging and dispersal, especially if adjacent habitat may be potentially suitable (personal communication Scott Richardson, Service, October 6, 2003).

The proposed water exchange could lower water tables further stressing riparian vegetation within the Gila River floodplain. However, despite some localized mortality and reduced vigor resulting from several years of drought and reduced stream flow, most of the riparian vegetation in the project area is still intact. It is more likely that pygmy-owls would nest in the adjacent uplands. Because of the vast amount of floodplain in the project area and available edge, the potential impact to pygmy-owl foraging and dispersal habitat will be insignificant. The FWS biological opinion determined that the original proposed action may affect, but is not likely to adversely affect the pygmy-owl and no actions were required by Reclamation. The proposed action would be expected to have a negligible effect on the pygmy-owl.

Southwestern Willow Flycatcher. The number of flycatcher territories on the Gila River has declined substantially since 1999. Although the numbers of flycatchers at a few sites have remained stable (GRS007, GRS018), others have declined significantly or are no longer inhabited (e.g., GRS012, GRN08).

Depth to groundwater can exert a strong influence on the composition of arid region floodplain vegetation (Stromberg et al. 1996). Diminished flows in the Gila River during the breeding season can result in a decrease in groundwater depths upon which established vegetation relies.

Currently, there are two peizometers on the Gila River for which groundwater depths can be measured. These are at flycatcher breeding areas "GIKRNY dry" and "GIGS12" (see Table 7). Groundwater depths were measured from June 2001 to September 2003 and were compared to the actual flows recorded at the Kelvin gage. This data shows a correlation between flows in the river and groundwater levels as measured at these two sites. However, groundwater response to river flows at the other sites could vary considerably based on site specific geomorphology and hydrology. Additional piezometers, groundwater modeling, and vegetation data would be needed to determine site specific responses to changes in flow.

At some point, decreasing groundwater levels will affect the vigor and/or foliage volume of the vegetation. A threshold of 6 feet depth to groundwater was used for Goodding's willow and 16 feet depth to groundwater for saltcedar. J.C. Stromberg (personal communication and unpublished data 2003) has suggested a threshold of 10 feet for the action area for cottonwood and willow habitat. While the groundwater level at KRNYUP and GS12 appears marginal for sustaining cottonwood and willows, saltcedar should not be affected. The number of flycatcher territories has decreased at both of these sites.

Because this reach of the Gila River has already endured several years of stress due to drought and reduced flows, maintaining greater than the minimum depth to groundwater may be necessary to sustain the vegetation (J.C. Stromberg personal communication September 2003). After several years with significantly less streamflow and a subsequent drop in groundwater depths, recovery of the water table and vegetation may not occur until significantly greater flows are delivered downstream. However, according to Smith et al. (1998), saltcedar can recover quickly from removal of the water table as well as from a significant depletion of soil water from the upper profile.

In a system that has already been stressed due to past drought and reduced flows, any further reduction in flows could result in the loss of vigor and/or mortality of vegetation in the habitat used by nesting flycatchers. The reliance of flycatchers on free-flowing and standing water or moist soil conditions is well established. Currently suitable flycatcher habitat will likely become unsuitable if foliage volume and prey base production declines resulting in the abandonment of sites and/or a reduction in productivity.

The proposed exchange may exacerbate the affect of the drought on flycatchers. Any additional reduction of flow, as is caused by the proposed action, may in the short term

lead to a possible decline in the foraging resource during the breeding season, and ultimately nest abandonment and local population declines. However, movement data USGS has collected since 1996 strongly suggests that flycatchers that abandon the Gila River sites can successfully establish territories at other more suitable locations (Kenwood and Paxton 2001). The FWS biological opinion also recognizes that at least some flycatchers can be expected to disperse to suitable habitat on the San Pedro River or in other drainages.

The proposed action would have negligible impact on flycatchers above San Carlos Reservoir. Under current drought conditions, it is unlikely that water levels in the Reservoir would be sufficiently close enough to these birds to affect reproduction or distribution.

The FWS biological opinion concluded that the proposed action would adversely affect, but not jeopardize the continued existence of the southwestern willow flycatcher. The reasonable and prudent measures to minimize any incidental take of flycatchers are discussed in section 2.4 of this EA.

Spikedace. The existence of spikedace in the action area is unlikely because of degraded habitat and high predator load. No affect on spikedace is anticipated. The proposed action would not destroy or adversely modify critical habitat for spikedace (FWS 2004).

Loach Minnow. The existence of loach minnow in the action area is unlikely because of degraded habitat and high predator load. No affect on loach minnow is anticipated. The proposed action would not destroy or adversely modify critical habitat for loach minnow (FWS 2004).

Razorback Sucker. The existence of razorback suckers within the Reservoir and in the Gila River downstream of Coolidge Dam is unlikely because of degraded habitat and high predator load. However, the retention of water in the Reservoir would affect designated critical habitat in a positive manner by maintaining a minimum pool and reducing the risk of a catastrophic fish kill.

3.3 Cultural Resources

3.3.1 Affected Environment

An archaeological survey of portions of the Reservoir was conducted in 1993 by Archaeological Consulting Services (ACS), Ltd., at the request of the BIA (Black and Green 1995). The survey encompassed 5,200 acres in the upper drawdown zone of the Reservoir between elevation 2550 (equivalent to the top of the spillway) and 2450 (the pool surface at the time the field work was conducted). Two hundred and ninety archaeological sites were recorded by ACS. The sites are diverse, ranging from several thousand year old campsites of Archaic hunter-gatherers to 20th century trash dumps (Reclamation 1998b). The majority of sites were identified as prehistoric Hohokam and

Mogollon and historic Apache. A similar mix of cultural sites is likely to exist at lower elevations within the lake basin.

An additional survey was undertaken by the BIA in 2002 in the drawdown zone on the western side of the Reservoir immediately north of Coolidge Dam (Hagenbuckle and Vanderpot 2003). Thirty mostly prehistoric sites were identified in the 1,443 acres surveyed. The BIA has also prepared a draft management plan for sites located within BIA withdrawn land upstream of the dam and is consulting with the State Historic Preservation Office (SHPO) on the plan. The management plan will address the issue of site loss and damage from fluctuating reservoir levels and vandalism and present options for preservation and management of remaining cultural resources.

According to the surveys, archaeological sites within the reservoir draw down zone were affected to varying degrees by erosion from wave action, sheetwash, and wind. Wave action and near shore currents destroyed site context and in some cases moved large artifacts, resulting in extensive damage to architectural and artifact deposit, and a loss of integrity.

3.3.2 No Action

Without the proposed exchange, evaporation and seepage will reduce the existing minimum pool to a level below 19,000 af before summer monsoon storms increase inflows to the reservoir. BIA data show reservoir levels have fluctuated in the 19,000 af to 20,500 af zone 46 times since 1937. Archaeological sites within this drawdown zone have already been damaged and their integrity compromised by the effects of repeated changes in water level.

3.3.3 Environmental Consequences of the Proposed Action

The proposed water exchange would establish a new minimum pool volume somewhere between 20,000 af and 40,000 af depending on the availability of SCIP-owned stored water and excess water flowing into the Reservoir during 2004. The shoreline within this range has been extensively eroded by wave action from 48 pool fluctuation cycles in 27 of the last 67 years. Previous surveys have documented that archaeological sites in the draw down zone have lost some or all of their integrity as a result of normal operation of the dam. Consequently, retention of this additional water within the drawdown zone would not adversely affect archaeological sites. Reclamation has sought SHPO concurrence with this determination.

Activities associated with the exchanged CAP water would not affect cultural resources. Exchanged water would be diverted from the CAP canal into existing SCIP irrigation conveyance infrastructure and applied to farmland already engaged in agricultural production.

3.4 Environmental Justice and Socioeconomic Considerations

3.4.1 Affected Environment

The Executive Order on Environmental Justice (EO 12898) requires Federal agencies to identify and address, as appropriate, disproportionately high and adverse human health, social, or environmental effects of Federal actions on minority populations and low-income populations, when such analysis is required by NEPA. Low-income populations include communities or individuals living in close geographic proximity to one another, as identified by Bureau of Census statistical thresholds for poverty. Minority populations are identified where the percentage of minorities in the affected area exceeds 50 percent, or where the minority population percentage of the affected area is meaningfully greater than the minority population percentage of a much broader area. EO 12898 requires that this responsibility apply equally to Federal actions affecting Native Americans. Therefore, when minority and low-income populations are discussed, Indian populations are included.

The San Carlos Apache Indian Reservation spans Gila, Graham, and Pinal counties. According to the 2000 U.S. Census, the Reservation has a population of 9,385, which represents almost four percent of the population of the tri-county area (Census Bureau 2004). Federal and tribal government agencies are the major employers on the Reservation, offering employment opportunities in health, education, and economic services. Major private-sector employers include the Apache Gold Casino Resort, Apache Timber Products, and San Carlos Lake Development Corporation.

The Tribe faces severe social challenges because of high unemployment and slow economic development. In 2002, unemployment on the Reservation was 25.6 percent, or three times higher than the State average of 6.3 percent. Approximately 48 percent of families lived below the poverty level in 1999. Median family income was $17,585 compared to the state-wide median of $46,723.

San Carlos Reservoir is a key public attraction and source of revenue for the Tribe. The total economic value of boating and fishing was estimated to be $3.7 million in 1996 (the last year lake volume remained consistently above 100,000 af), reflecting expenditures of recreation users for licenses and other amenities within the local economy (Reclamation 1998a). Gross revenue from the sport fishery component alone was estimated to be $1.5 million in 1996 (BIA 1998).

Direct revenue to the Tribe is collected from recreation license sales. Licenses associated with lake-based recreation are sold for fishing, boating, hiking, and camping. In recent years, license revenues have supported employment for approximately 50 people in tribal government. In addition, the San Carlos Lake Development Corporation, which has invested millions of dollars in recreation facilities such as the San Carlos Lake Store and Soda Canyon Marina, employs up to 16 people from the San Carlos area. Collectively these jobs represent almost 3 percent of the tribal labor force.

Vendor sales of recreation licenses in the last 10 years dropped from a high of almost $1.3 million in 1996 to $868,000 in 2003, representing a 31 percent decline in revenue. This decrease is partly attributable to lower water levels in San Carlos Reservoir (Table 8).

Table 8. Annual recreation license sales* and reservoir levels.

Year	License Sales (Dollars)[1]	Reservoir Levels (Range/Mean in af)[2]
1994	1,169,000	190,200 – 540,000 / 365,100
1995	1,256,000	440,100 – 879,500 / 659,800
1996	1,266,000	139,300 – 527,300 / 333,300
1997	1,080,000	40,800 – 211,400 / 126,100
1998	1,188,000	76,630 - 271,000 / 173,815
1999	906,000	39,400 – 84,640 / 62,020
2000	1,188,000	25,810 -239,000 / 132,405
2001	892,000	67,448 – 269,100 / 168,274
2002	834,000	36,750 – 71,220 / 53,985
2003	868,000	28,480 – 42,630 / 35,555

[1] Source: San Carlos Recreation and Wildlife Department

[2] Source: USGS San Carlos Reservoir gage station (No. 09469000)

* Total sales data includes fees for hunting.

3.4.2 No Action

Drawdown from the current pool elevation would create conditions that are less desirable for boating and fishing, resulting in further decline of revenue generated by recreation license sales. Severe drawdown could cause a major fish kill that would cripple the recreation industry at the Reservoir. Fish kills of varying severity have been recorded in 31 of the last 67 years (see section 3.2.1). In 1976, substantial dewatering of the Reservoir resulted in a catastrophic fish kill, at an estimated loss of $850,000 (BIA 1998). As recently as August 1997 extremely stressed fish near the water surface and a kill of about 1100 fish was reported with 44,000 af of storage in the Reservoir.[8]

3.4.3 Environmental Consequences of the Proposed Action

The proposed action would provide social and economic benefits to the Tribe from increased sales revenue and preservation of jobs directly and indirectly associated with lake-based recreation. Maintaining the minimum pool in the 20,000 af to 40,000 af range likely would generate more than $800,000 in recreation license sales by the end of 2004.[9]

The proposed action would not result in disproportionate adverse effects to minority or low-income populations as defined by EO 12898.

[8] Water sampling conducted the day after the fish kill recorded depleted oxygen concentrations and high hydrogen sulfide conditions that are believed to have resulted from low reservoir volume and breakdown of thermal stratification.

[9] Projected revenue is based on recreation license sales from recent low-water years.

3.5 Indian Trust Assets

3.5.1 Affected Environment

Indian trust assets are legal interests[10] in assets held in trust by the U.S. Government for Indian tribes or individual Indians. Assets are anything owned that has monetary values. The asset need not be owned outright, but could be some other type of property interest, such as a lease or a right of use. Assets can be real property, physical assets, or intangible property rights. Exchanged water retained in the Reservoir by the Tribe is an example of a trust asset.

The United States has an Indian trust responsibility to protect and maintain rights reserved by or granted to Indian tribes or individual Indians by treaties, statutes, and Executive Orders, which rights are sometimes further interpreted through court decisions and regulations. This trust responsibility requires all Federal agencies ensure their actions afford reasonable protection of Indian trust assets.

San Carlos Reservoir and Coolidge Dam are owned and operated by the BIA solely for the benefit of SCIP water users. Operation of Coolidge Dam to meet the irrigation demand of SCIP is a nondiscretionary function provided for under the San Carlos Project Act of 1924 and the Decree. In 2003, the U.S. District Court held that SCIP's operation in compliance with the 1924 Act and the Decree is not a breach of the Government's general trust responsibilities to the Tribe (*San Carlos Apache Tribe v. United States*, 272 F.Supp.2d 860).[11] The Court found that drawdown of the Reservoir has been a part of the routine operation of Coolidge Dam since the establishment of SCIP as provided for under the 1924 Act and the Decree.

3.5.2 No Action

There would be no effect to trust assets of the Tribe under this alternative.

3.5.3 Environmental Consequences of the Proposed Action

The existing minimum pool is a trust asset of the Tribe. Accrual of additional water under the proposed exchange would enhance the value of this asset for recreation and the sport fishery.

[10] Legal interest means there is a primary interest for which a legal remedy, such as compensation or injunction, may be obtained if there is improper interference with the trust asset. Trust assets do not include things in which a tribe or individuals have no legal property interest.

[11] The U.S. District Court cited *Nevada v. United States*, 463 U.S. 110, 128, 141, 103 S.Ct. 2906, 77 L.Ed.2d 509 (1983) in rendering its decision.

CHAPTER 4 - LIST OF PREPARERS

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The following list summarizes agencies and organizations that will receive copies of the draft EA:

Ak-Chin Indian Community
Arizona Department of Environmental Quality
Arizona Department of Water Resources
Arizona Game and Fish Department
Arizona State Historic Preservation Office
ASARCO Incorporated
Audubon Society
Bureau of Indian Affairs
Center for Biological Diversity
Central Arizona Water Conservation District
Gila River Indian Community
Hopi Tribe
Phelps Dodge Corporation
Salt River Pima-Maricopa Indian Community
San Carlos Apache Tribe
San Carlos Irrigation and Drainage District
Tohono O'odham Nation
U.S. Fish and Wildlife Service
White Mountain Apache Tribe

CHAPTER 5 - RELATED ENVIRONMENTAL LAWS/DIRECTIVES

The following is a list of Federal laws, Executive Orders, and other directives that apply to the action alternatives discussed in this EA:

National Environmental Policy Act of 1969, as amended (NEPA) - This law requires Federal agencies to evaluate the potential environmental consequences of major Federal actions. An action becomes "federalized" when it is implemented, wholly or partially funded, or requires authorization by a Federal agency. The intent of NEPA is to promote consideration of environmental impacts in the planning and decision-making process prior to project implementation. NEPA also encourages full public disclosure of the proposed action, accompanying alternatives, potential environmental effects, and mitigation.

This EA was prepared in accordance with the requirements of NEPA. A copy of the draft EA was distributed for 10-day public comment.

Fish and Wildlife Coordination Act of 1934, as amended (FWCA) - The FWCA provides a procedural framework for the consideration of fish and wildlife conservation measures in Federal water resource development projects. Coordination with the FWS and State wildlife management agencies are required on all Federal water development projects.

The proposed project is the result of ESA Section 7(a)(2) consultation between Reclamation and FWS. Coordination between Reclamation and FWS has been ongoing since the action was proposed by the Tribe. The current level of coordination is sufficient to meet any regulatory needs required by the FWCA.

Endangered Species Act of 1973, as amended (ESA) - The ESA provides protection for plants and animals that are currently in danger of extinction (endangered) and those that may become so in the foreseeable future (threatened). Section 7 of this law requires Federal agencies to ensure that their activities do not jeopardize the continued existence of threatened or endangered species or adversely modify designated critical habitat.

Reclamation has agreed to implement as mitigation for project effects reasonable and prudent measures prescribed in the *Biological Opinion on the Bureau of Reclamation's Approval of Water Exchange by the San Carlos Apache Tribe for Retention in San Carlos Reservoir*, dated March 8, 2004. The draft opinion culminated four months of formal consultation between Reclamation and the FWS in accordance with ESA Section 7(a)(2).

Migratory Bird Treaty Act of 1918, as amended (MBTA) – The MBTA is the domestic law that implements the United States' commitment to the protection of shared migratory bird resources. The MBTA prohibits the take, possession, import, export, transport, selling or purchase of any migratory bird, their eggs, parts or nests.

No direct take of migratory birds would result from the proposed action. Incidental take as defined under ESA is possible for bald eagle and southwestern willow flycatcher. The

FWS has waived prosecution under MBTA if take occurs and such take is in compliance with the terms and conditions implementing the reasonable and prudent measures of the biological opinion.

Bald and Golden Eagle Protection Act – This statute prohibits any possession or taking of bald and golden eagles. Prohibited activities include the take, possession, import, export, transport, selling or purchase of any bald or golden eagle, their eggs, parts or nests.

No direct take of any bald eagle would result from the proposed action. Incidental take as defined under ESA is possible for the bald eagle. The FWS has waived prosecution under the Bald Eagle Protection Act if take occurs and such take is in compliance with the terms and conditions implementing the reasonable and prudent measures of the biological opinion.

Clean Water Act of 1977, as amended (CWA) - The CWA strives to restore and maintain the chemical, physical, and biological integrity of the nation's waters by controlling discharge of pollutants. The basic means to achieve the goals of the CWA is through a system of water quality standards, discharge limitations, and permits. Section 404 of the CWA identifies conditions under which a permit is required for actions that result in placement of fill or dredged material into waters of the United States. In addition, a 401 water quality certification and 402 National Pollutant Discharge Elimination System (NDPES) permit are required for activities that discharge pollutants to waters of the U.S. The EPA has delegated responsibility to administer water quality certification and NPDES programs in Arizona to ADEQ.

The action would not result in a discharge of a pollutant to waters of the United States.

National Historic Preservation Act of 1966, as amended (NHPA) - Federally-funded undertakings that have the potential to affect historic properties are subject to Section 106 of the NHPA. Under this act, Federal agencies are responsible for the identification, management, and nomination to the National Register of Historic Places of cultural resources that would be affected by Federal actions. Consultation with the Advisory Council on Historic Preservation and the SHPO (or Tribal Historic Preservation Office) is required when a Federal action may affect cultural resources on, or eligible for inclusion on, the National Register.

Shoreline disturbances caused by fluctuating water levels that result from the proposed action would occur within the drawdown zone for normal lake operations and would not adversely affect National Register eligible historic properties. Fluctuation of lake levels within this zone has been repeated numerous times since storage began in 1928.

Executive Order 12898 (Environmental Justice) - This Order directs Federal agencies to identify and address, as appropriate, disproportionately high and adverse human health and environmental effects of their programs, policies, and activities on minority and low-income populations.

The proposed action would not adversely and disproportionately affect low income or minority populations as defined by EO 12898.

Indian Trust Assets – Indian trust assets are legal interests in assets held in trust by the U.S. Government for Indian tribes or individual Indians. Assets are anything owned that has monetary values. Assets can be real property, physical assets, or intangible property rights.

The proposed action would not adversely affect Indian trust assets.

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APPENDIX A

San Carlos Apache Tribe
Recent CAP Water Exchanges

1997. The Secretary of the Interior directed Reclamation to provide $300,000 under the authority of the Emergency Drought Assistance Act to purchase approximately 8,000 af of CAP water. The Tribe and the Phelps Dodge Corporation also contributed $78,000 each to purchase additional CAP water in the amount of approximately 4,200 af. Reservoir levels were expected to drop from approximately 55,800 af in mid-August to 10,000 af by October 15, 1997. The combined purchases of CAP water would retain an additional 12,200 af, assuring a total reservoir storage volume of 22,200 af by the mid-October SCIP canal maintenance dry up. Reclamation determined that the Federal action (i.e., purchase and delivery of 8,000 af) would "not affect endangered species." The reduction of river flow late in the growing season would have minimal impact on riparian vegetation. Reclamation prepared a Categorical Exclusion Checklist (CEC) for the action in August 1997.

1999. Up to a total of 34,000 af of water was requested by the Tribe for exchange in 1999 (see Table A-1). Approximately $1.5 million was appropriated by Congress to acquire SCIP-owned stored water in the Reservoir, as well as excess inflows to the Reservoir. The delivery of the water to SCIP was scheduled for the period June 1, 1999, to October 15, 1999, when annual dry-up maintenance activities are scheduled to begin on the SCIP system. After June 1, all releases from Coolidge Dam were suspended, leaving approximately 1.7 cubic feet per second (cfs) in the river due to seepage through the gates, and minor additional input from several springs. The retention of water in the Reservoir would only delay the dry up of the river, and the temporary reduction in releases from the dam were not expected to adversely affect habitat for the endangered southwestern willow flycatcher or listed fishes. Critical habitat for listed fish species had not yet been designated. Reclamation concluded that there would be no affect to federally-listed species. Reclamation completed a CEC for the action in May 1999.

2000. The Arizona Congressional delegation requested the Secretary of Interior to release $1.4 million in Federal funds under the Emergency Drought Relief Act (43 USC 2201 et seq.) to acquire exchanged CAP water up to a total of 40,000 af, including all inflows to the reservoir, after June 1, 2000. Apparently early monsoonal precipitation was sufficient to relieve drought conditions in the short term, and only 3,486 af were actually acquired. Reclamation concluded that there would be no affect to federally-listed species. Reclamation completed a CEC for the action in June 2000.

2002. Drought conditions again threatened the sport fisheries in 2002. The Tribe provided $1.2 million to SCIP-owned water in the Reservoir up to a maximum of 33,000 af. The volume in the Reservoir on May 19, 2002, was 59,700 af, of which 17,600 af was already owned by the Tribe from purchases in previous years. After the CAP exchange, all inflows to the Reservoir, including about 9,100 af of stored water that was not purchased, were to be released to downstream users.

On March 29, 2002, Reclamation and the FWS initiated Section 7 consultation on an expedited "emergency" basis on the proposed exchange. This consultation was initiated in order for Reclamation to approve the sale of this water as expeditiously as possible,

thereby, allowing the Tribe to hold the water in the Reservoir and minimize the risk of a fish kill.

On April 10, 2002, Reclamation received a memorandum from the FWS documenting their verbal recommendations on actions to minimize impacts to listed species and designated critical habitat. The species of concern were the bald eagle, southwestern willow flycatcher, spikedace, loach minnow, and razorback sucker.

Reclamation submitted a biological assessment (Assessment) on its approval of the water purchase to the FWS on May 10, 2002, as required under Section 7 (c) of the Endangered Species Act of 1973, as amended, and 50 CFR 402.12. Reclamation concluded that the purchase of water by the Tribe and the reduction or cessation of flows in the Gila River downstream of Coolidge Dam may affect the flycatcher and the bald eagle. In addition, this water purchase would affect designated critical habitat for the spikedace and loach minnow. There would be no affect on the razorback sucker.

Reclamation and the Service conducted several phone conferences on the issue but a final biological opinion has not been received from the FWS. In the interim, Reclamation attempted to implement a number of the recommendations in the FWS' April 10, 2002, memorandum. These actions included monitoring river flows via helicopter flights in 2002, continued monitoring of bald eagle and flycatcher occupancy and productivity, conducting a survey for spikedace and loach minnow, and investigating opportunities to use CAP water to create or enhance flycatcher habitat along the lower Gila River or at other locations in Arizona, in lieu of the populations potentially affected by the water purchase. Reclamation also processed a CEC.

2003. The Tribe requested a water exchange that would consist of an exchange of CAP water for water stored in excess of the Reservoir's 34,000 af minimum pool and natural flow entering the Reservoir during the period of March 17 to April 15, 2003. Only the natural flow in excess of that necessary for release to maintain a 50 cfs flow in the Gila River at the gage at Kelvin would be available for exchange. With the minimum flow requirement in place, Reclamation determined there would be no affect on listed species or critical habitat. Reclamation prepared a CEC for the action.

Table A-1. CAP water exchanges.

Year	Purchased Water[1] (af)	Minimum Pool[2] (af)	Date of CEC
1997	12,200[5]	22,200	8/21/97
1999	34,000[3]	39,000	5/27/99
2000	3,486[3]	33,000	6/2/00
2002	33,000[4]	39,000	3/29/02
2003	5,950[4]	39,000	3/17/03

1 Maximum amount of water for which funds were appropriated.
2 Desired minimum pool.
3 Federal funds.
4 Funding from San Carlos Apache Tribe.
5 Federal, Phelps Dodge, and San Carlos Apache Tribe funds.