



United States Department of the Interior

FISH AND WILDLIFE SERVICE

P.O. Box 1306
Albuquerque, New Mexico 87103



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Memorandum

To: Supervisor, New Mexico Ecological Services Office, Albuquerque, New Mexico

From: ^{For} Regional Director, Region 2 

Subject: Intra-Service Section 7 Consultation for Minor Water Depletions of 100 Acre-feet or Less From the San Juan River Basin

This is the Fish and Wildlife Service's (Service) intra-Service biological opinion on individual depletions of 100 acre-feet or less (up to an annual aggregate ceiling not to exceed 3,000 acre-feet) from the San Juan River in New Mexico, Colorado, and Utah, and the effects of the proposed action on the endangered Colorado pikeminnow (*Ptychocheilus lucius*), formerly known as the Colorado squawfish, razorback sucker (*Xyrauchen texanus*), and southwestern willow flycatcher (*Empidonax traillii extimus*), and the critical habitat designated for the two fish species on the San Juan River. No critical habitat has been designated for the southwestern willow flycatcher within the proposed action area.

This opinion is issued in accordance with section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531 *et seq*) and is based on the commitment provided by the Bureau of Reclamation in its July 30, 1991, memorandum to the Service "... to operate Navajo Dam in the manner most consistent with endangered fish recovery, including mimicking a natural hydrograph if that is the recommended course, for the life of Navajo Dam," information contained in the biological opinions that have been issued for over 50 minor depletions on the San Juan River since 1992; the October 22, 1992, San Juan River Basin Recovery Implementation Program document; the 1998 flow recommendations for the San Juan River approved by the San Juan Recovery Implementation Program's Coordination Committee on November 12, 1998; and data on file with the Service. Literature cited in this opinion is not a complete bibliography of all literature available on the species of concern or the San Juan River. Literature cited is limited to that necessary to document the effects of the proposed action.

A wide variety of actions may, on an individual basis, require depletion of waters from the San Juan River throughout the basin and may result in site-or action-specific impacts not considered

in this opinion. Although the depletion effects of those actions on the San Juan may be accommodated through this consultation, individual depletions over 100 acre-feet or cumulative depletions over 3,000 acre-feet annually must be addressed separately.

CONSULTATION HISTORY

The San Juan River Recovery Implementation Program (Program) was initiated in October 1992, to address recovery needs for the two endangered fish, while allowing for water development in the Basin in compliance with Federal and State laws, interstate compacts, Supreme Court decrees, and federal trust responsibilities to the Southern Utes, Ute Mountain Utes, Jicarilla Apaches, and the Navajos. At the inception of the cooperative effort to formulate the Program, participants agreed that a relatively small amount of water was to be set aside to accommodate small individual requests for its use. That amount was fixed at an annual aggregate of 3,000 acre-feet. For the past 6 years, requests for these minor depletions were consulted upon individually until the fall of 1998, when the 3,000 acre-feet ceiling was reached. The Service now proposes, based on the information gained by the research activities of the Program and on a review of the types and amounts of depletions that have comprised the projects encompassed by the previous 3,000 acre-feet block of water, to consult on the aggregate, rather than the individual depletions.

From March 1992 to December 1998, the Service consulted on approximately 58 proposed actions (over the course of the 6 years, some projects were consulted upon twice to address 2 separate contracts of 5 years duration each for the same depletion). These depletions (Table 1) ranged in quantity from 0.02 acre-feet to 500 acre-feet and in duration from a matter of weeks (use of water for dust abatement during highway or pipeline construction) to perpetuity (stock tanks). Some consultation requests, such as that by the San Juan National Forest, dealt with several dozen small individual projects that, combined together, were still considered minor depletions from the San Juan Basin. With the exception of only a few proposed actions with indirect effects beyond the depletion of the flow of the river, the effects of the minor depletions were found to avoid jeopardy to the endangered fish species by the operation of Navajo Dam to mimic the natural hydrograph of the San Juan River. For those proposed depletions that were considered likely to result in jeopardy to the endangered fish species through means other than depletion of flows (i.e., contamination of water through its use by the action under consultation), specific reasonable and prudent alternatives were formulated to avoid jeopardy.

The potential effects of the water depletion proposed for this action have been analyzed in the context of the commitments and agreements established within the Recovery Implementation Program and the accepted flow recommendations for the San Juan Basin.

On June 5, 1997, the Secretaries of the Departments of Commerce and the Interior signed Secretarial Order No. 3206 regarding the Endangered Species Act and enhanced Native American participation. The Order requires the Service to provide timely notification to affected tribes as soon as the Service is aware that a proposed federal action subject to formal consultation

may affect tribal rights or tribal trust resources. Because the proposed action involves water depletion from the San Juan River, it may affect tribal rights of the Southern Ute Indian Tribe, the Ute Mountain Ute Indian Tribe, the Jicarilla Apache Indian Tribe, and the Navajo Nation. By letters dated January 11, 1999, the Service notified the four tribes and their designated legal representatives of this consultation and invited the tribes to participate. One reply was received from the legal counsel of the Jicarilla Apache Indian Tribe agreeing to participate. All documents generated for this consultation were provided to the Tribe's representative for review. A draft copy of this biological opinion was also reviewed by the legal counsel for the Jicarilla Apache Tribe and her comments were considered in preparing this final biological opinion. The Service appreciates the participation by Ms. Jessica Aberly on behalf of the Tribe.

BIOLOGICAL OPINION

It is the Service's biological opinion that the proposed action of allowing minor depletions from the San Juan River of 100 acre-feet or less, not to exceed 3,000 acre-feet in aggregate annually, is not likely to jeopardize the Colorado pikeminnow, razorback sucker, or southwestern willow flycatcher; and is not likely to result in the adverse modification or destruction of designated critical habitat for either fish species.

DESCRIPTION OF PROPOSED ACTION

This biological opinion addresses the impact of all individual projects with average annual water depletions of 100 acre-feet or less that will result in an annual cumulative total of 3,000 acre-feet in the San Juan Basin. This biological opinion is for a period of 5 years or until the cumulative limit of 3,000 acre-feet is anticipated to be exceeded, whichever comes first.

A standard letter/memorandum will be sent to each consulting Federal Agency in response to its request for consultation on depletions of 100 acre-feet or less (Appendix). Copies of such correspondence will be provided to the New Mexico Ecological Services Field Office. That Office will maintain the ongoing tabulation of depletions within this minor category.

STATUS OF THE SPECIES/CRITICAL HABITAT

A marked decline in Colorado pikeminnow and razorback sucker populations can be closely correlated with the construction of dams and reservoirs between the 1930s and the 1960s, introduction of nonnative fishes, and removal of water from the Colorado River system. Behnke and Benson (1983) summarized the decline of the natural ecosystem. They pointed out that dams, impoundments, and water use practices are probably the major reasons for drastically modified natural river flows and channel characteristics in the Colorado River Basin. Dams on the main stem Colorado and San Juan rivers have essentially segmented the river systems (Tyus 1984), blocking Colorado pikeminnow and razorback sucker spawning migrations and drastically changing river characteristics, especially flows and temperatures. In addition, major changes in species composition have occurred due to the introduction of nonnative fishes, many

of which have thrived as a result of changes in the natural riverine system (i.e., flow and temperature regimes). The decline of endemic Colorado River fishes seems to be at least partially related to competition or other behavioral interactions with nonnative species, which have perhaps been exacerbated by alterations in the natural fluvial environment.

As the southernmost tributary of the Upper Colorado River Basin, the San Juan River peaks earlier in the year and attains warmer water temperatures than other Upper Basin streams (U.S. Geological Survey 1995a and 1995b); these characteristics are conducive to longer and better growth potential for young Colorado pikeminnow and razorback suckers. Any additional large loss of water or further degradation of remaining habitats will alter the characteristics of the San Juan River that favor the Colorado pikeminnow and razorback sucker.

The southwestern willow flycatcher has experienced losses of habitat and reductions in range through activities that destroy or modify the natural mosaic of riparian habitats bordering those watercourses. In addition, physical destruction of riparian habitat through overgrazing by domestic livestock has been noted in the decline of the flycatcher.

Colorado Pikeminnow

Status of the Colorado pikeminnow (Range-wide)

The Colorado pikeminnow evolved as the main predator in the Colorado River and San Juan River systems. The diet of Colorado pikeminnow longer than 3 or 4 inches consists almost entirely of other fishes (Vanicek and Kramer 1969). The Colorado pikeminnow is the largest cyprinid fish (minnow family) native to North America and, during predevelopment times, may have grown as large as 6 feet in length and weighed nearly 100 pounds (Behnke and Benson 1983). These large fish may have been 25-50 years of age. The Colorado pikeminnow currently occupies about 1,030 river miles in the Colorado River system (20 percent of its original range) and is now found only in the San Juan and other subbasins above Glen Canyon Dam (Tyus 1990 and 1991).

Extreme fluctuations occurring within the framework of a natural annual hydrograph may enhance spawning success of native species and inhibit exotic species. Haynes et al. (1984) reported that fish species such as Colorado pikeminnow, having evolved under highly fluctuating flow conditions, were better able to survive and successfully recruit under those conditions than the introduced species. The decline of endemic Colorado River fishes seems to be partially related to competition or other behavioral interactions with nonnative species, which perhaps have been exacerbated by alterations in the natural fluvial environment. Valdez (1990) reported that densities of three nonnative cyprinids (red shiner, *Cyprinella lutrensis*, sand shiner, *Notropis ludibundus*, and fathead minnow, *Pimephales promelas*) in the Colorado River were much lower following high-flow years and increased three to four times in a 2-year period during normal- and low-water years.

The life-history phases that appear to be most critical for the Colorado pikeminnow include spawning, egg fertilization, and development of larvae through the first year of life. These phases of Colorado pikeminnow development are tied closely to specific habitat requirements. Natural spawning of Colorado pikeminnow is initiated on the descending limb of the annual hydrograph as water temperatures approach 20° Celsius (C). Spawning, both in the hatchery and in the field, generally occurs in a 2-month timeframe between July 1 and September 1, although high flow water years may suppress river temperatures and extend spawning in the natural system into September. Conversely, during low flow years when the water warms earlier, spawning may occur in late June.

A natural hydrograph with a large spring peak; a gradually declining/descending limb into early summer; and low, stable flows through summer, fall, and winter are thought to create the best habitat conditions for endangered fishes while maintaining the integrity of the channel geomorphology. Tyus and Karp (1989) pointed out the importance of peak flows (spring runoff) associated with reproductive activities of Colorado pikeminnow. They further stated that alteration of this hydrological event may affect initiation of Colorado pikeminnow migration and spawning. Additionally, maintenance of low stable flows in summer and fall are necessary for growth and survival of young Colorado pikeminnow.

Temperature also has an effect on egg development and hatching. In the laboratory, egg mortality was 100 percent in a controlled test at 13° C. At 16° to 18° C, development of the egg is slightly retarded, but hatching success and survival of larvae were higher. At 20° to 26° C, development and survival through the larval stage was as high as 59 percent (Hamman 1981). Juvenile temperature preference tests showed that preferred temperatures ranged from 21.9° to 27.6° C. The preferred temperature for juveniles and adults was estimated to be 24.6° C. Temperatures near 24° C also are needed for optimal development and growth of young (Miller et al. 1982).

Miller et al. (1982) concluded from collections of larvae and young-of-year below known spawning sites that there is a downstream drift of larval Colorado pikeminnow following hatching. Extensive studies in the Yampa and upper Green rivers have demonstrated downstream distribution of young Colorado pikeminnow from known spawning areas (Archer et al. 1986; Haynes et al. 1985). Miller et al. (1982) also found that young-of-year Colorado pikeminnow, from late summer through fall, preferred natural backwater areas of zero velocity and less than 1.5-foot depth over a silt substrate. Juvenile Colorado pikeminnow habitat preferences are similar to those of young-of-year fish, but they appear to be mobile and more tolerant of lotic conditions away from the sheltered backwater environment. Only two Colorado pikeminnow confirmed spawning sites, as defined in the Colorado Squawfish Recovery Plan, have been located in the Upper Basin: river mile 16.5 of the Yampa River and river mile 156.6 of the Green River. These areas have the common characteristics of coarse cobble or boulder substrates forming rapids or riffles associated with deeper pools or eddies. It is believed that a stable, clean substrate is necessary for spawning and incubation. Substrates are swept clean of finer sediments by high flows scouring the bed prior to the spawning period.

The Colorado River Fishes Recovery Team (consisting of scientists from the entire Colorado River Basin, including representatives from State wildlife agencies of California, Arizona, New Mexico, Utah, and Colorado, as well as Federal representatives from the National Park Service, Reclamation, and the Service) recommended that the San Juan River be added to the recovery plan. The updated Colorado Squawfish Recovery Plan, dated August 6, 1991, states that the species can be downlisted to threatened when all recovery areas (including the San Juan River from Lake Powell upstream to the confluence of the Animas River) have naturally self-sustaining populations (Fish and Wildlife Service 1991). The San Juan River is also included in the delisting criteria.

Status of the Colorado pikeminnow (In the Action Area)

Based on early fish collection records, archaeological finds, and other observations, the Colorado pikeminnow was once found throughout warmwater reaches of the entire Colorado River Basin, including reaches of the upper San Juan River and possibly its major tributaries. Colorado pikeminnow was apparently never found in colder headwater areas. Seethaler (1978) indicated that the species was abundant in suitable habitats throughout the entire Colorado River Basin prior to the 1850s. Platania and Young (1989) summarized historic fish collections in the San Juan River drainage, which indicate that Colorado pikeminnow once inhabited reaches above what is now the Navajo Dam and Reservoir near Rosa, New Mexico. Since closure of the dam in 1962, physical changes (flow and temperature) associated with operation of the Navajo Project have eliminated Colorado pikeminnow in the upper San Juan River, both from the reservoir basin as well as from several miles of river downstream of the dam.

The San Juan River currently flows approximately 225 river miles from the Navajo Dam downstream to Lake Powell. The reach of known occupied Colorado pikeminnow habitat extends from Lake Powell upstream to river mile 158.4. Eight geomorphically distinct reaches have been identified by Bliesner and Lamarra (1995) in the San Juan between the two major features that essentially define the river for purposes of conservation of the endangered fish: Lake Powell at the downstream terminus of flowing water, and Navajo Dam as the upstream control of flows in the river. The eight distinct reaches were screened through several data sets within the categories of river width, channel contact geology (material in cut-banks and bedrock contact), riparian vegetation, channel gradient, channel pattern (braiding and sinuosity), tributary influence, anthropogenic influences (diversion dams, irrigation, levees, etc.), and aquatic habitat (six categories at three flow rates). Utilizing these categories, the following reaches of the San Juan have been identified by river mile (listed in parentheses):

1. Lake Powell influence (0 to 14)
2. Canyon (15 to 67)
3. Chinle to Aneth (68 to 105)
4. Aneth to Mixer (106 to 130)
5. Mixer to Hogback (131 to 154)
6. Hogback to Animas (155 to 180)

7. Animas to Blanco (181 to 213)
8. Blanco to Navajo Dam (214 to 224)

Of the 225 miles encompassed by the above reaches, about 159 of those are potentially available to the Colorado pikeminnow. Ryden and Pfeifer (1993) identified 5 diversion structures between Farmington, New Mexico, and the Utah state line that potentially act as barriers to fish passage at certain flows (Cudei, Hogback, Four Corners Power Plant, San Juan Generating Station, and Fruitland Irrigation Canal diversions). Since radio telemetry studies were initiated on the San Juan River in 1991, only one radio-tagged fish has been recorded moving upstream past one of the diversions. In 1995, an adult Colorado pikeminnow moved above the Cudei Diversion and then returned back downstream (Miller 1995). Other native fish have been found to move both upstream and downstream over all five of the weirs (Buntjer and Brooks 1997).

Colorado pikeminnow adults primarily use the San Juan River between river mile 119 (Four Corners) and river mile 148 (Cudei Diversion) (Ryden and Pfeifer 1993, 1994, 1995a, 1996). The multi-threaded channel, habitat complexity, and mixture of substrate types in this area of the river appear to provide a diversity of habitats favorable to Colorado pikeminnow on a year-round basis (Holden and Masslich 1997).

Based on radio telemetry studies and visual observations, two potential spawning areas have been located at river mile 132.0 and 131.15 (Miller 1994, Ryden and Pfeifer 1995a). Both of these sites are located in an area of the river known as the "Mixer" (river mile 133.4 to river mile 129.8). Ryden and Pfeifer (1995a) report that a Colorado pikeminnow captured at river mile 74.8 (between Bluff and Mexican Hat) made a 50-60 mile migration to the Mixer during the suspected spawning season in 1994. The fish then returned to within 0.4 river miles of its original capture location.

Successful reproduction was documented in the San Juan River in 1987, 1988, 1992, 1993, 1994, 1995, and 1996 by the collection of larval and young-of-year Colorado pikeminnow. Majority of the young-of-year pikeminnow were collected in the San Juan River inflow to Lake Powell (Archer et al. 1995, Buntjer et al. 1994, Lashmett 1994, Platania 1990). Some young-of-year pikeminnow have been collected from the vicinity of the Mancos River confluence in New Mexico and in the vicinity of the Montezuma Creek confluence near Bluff, Utah, and at a drift station near Mexican Hat, Utah (Buntjer et al. 1994, Snyder and Platania 1995). The collection of such young fish (only a few days old) at Mexican Hat during 2 years suggests that perhaps another spawning area for Colorado pikeminnow exists somewhere below the Mixer (Platania 1996). Capture of a larval Colorado pikeminnow at river mile 128 during August 1996, was the first larva collected below the suspected spawning site in the Mixer (Holden and Masslich 1997).

Platania (1990) noted that, during the 3 years of studies on the San Juan River, spring flows and Colorado pikeminnow reproduction were highest in 1987. He further noted catch rates for channel catfish were lowest in 1987. Subsequent studies (Brooks et al 1994) found declines in channel catfish in 1993; declines that have been attributed to a successive series of higher than

normal spring runoffs beginning in spring 1991 through 1993. Recent studies also found catch rates for young-of-year Colorado pikeminnow to be highest in high water years, such as 1993 (Buntjer et al. 1994, Lashmett 1994).

The ability of the Colorado pikeminnow to withstand adverse impacts to its populations and its habitat is difficult to discern given the longevity of individuals and their scarcity within the San Juan River basin. Effects on reproduction and recruitment of young may be masked by the presence of older specimens more capable of withstanding impacts. At this stage of the investigations on the San Juan River, the younger life stages of the species are considered the most vulnerable to predation, competition, and habitat degradation through contamination. Response times to rebound from these impacts at a population level are lengthy. Population stability and growth will be a function of the suitability of habitat provided based on the information currently being gathered by the San Juan River Basin Recovery Implementation Program, included herein by reference.

Experimental stocking of 100,000 young-of-year Colorado pikeminnow was conducted in November 1996 to test habitat suitability and quality for young life stages of this species (Lentsch et al. 1996). Monitoring in late 1996 and 1997 found these fish scattered in appropriate habitats from just below the upstream stocking site at Shiprock, New Mexico, to Lake Powell. During the fall of 1997, the fish stocked in 1996 were caught in relatively high numbers and exhibited good growth rates as well as good survival rates (Holden and Masslich 1997). In August 1997, an additional 100,000 young-of-year Colorado pikeminnow were stocked in the river. In October 1997, the young-of-year stocked two months previously were found distributed below stocking sites and relatively large numbers also nearly 10 miles above the Shiprock stocking location. The 1997 stocked fish were smaller than those stocked in 1996, but apparently could move about the river to find acceptable habitats (Holden and Masslich 1997).

Surface and ground water quality in the Animas, La Plata, Mancos, and San Juan River drainages have become significant concerns (Brogden et al. 1979). Potential heavy metal and/or selenium contamination in project-affected rivers and newly created reservoirs and the subsequent bioaccumulation in the food chain could become a problem for the predatory Colorado pikeminnow, as well as the razorback sucker.

Changes in water quality and contamination of associated biota are known to occur in Bureau projects in the San Juan drainage (i.e., irrigated lands on the Pine and Mancos Rivers) where return flows from irrigation make up a portion of the river flow or other aquatic sites downstream (Sylvester et al. 1988). Increased loading of the San Juan River and its tributaries with soil salts, elemental contaminants, and pesticides from irrigation return flows could potentially degrade water quality and cause harm to the endangered fishes.

Very little information is available on the influence of turbidity on the endangered Colorado River fishes. It is assumed, however, that turbidity is important, particularly as it affects the interaction between introduced fishes and the endemic Colorado River fishes. Because these

endemic fishes have evolved under natural conditions of high turbidity, it is concluded that the retention of these highly turbid conditions is an important factor for these endangered fishes. Reduction of turbidity may enable introduced species to gain a competitive edge which could further contribute to the decline of the endangered Colorado River fishes.

Critical Habitat

Critical habitat has been designated within the 100-year floodplain of the Colorado pikeminnow's historical range in the following section of the San Juan River Basin (59 F.R. 13374) (Fish and Wildlife Service 1993 and 1994).

New Mexico, San Juan County; and Utah, San Juan County. The San Juan River from the State Route 371 Bridge in T. 29 N., R. 13 W., section 17 to Neskahai Canyon up to the full pool elevation in the San Juan arm of Lake Powell in T. 41 S., R. 11 E., section 26.

Razorback Sucker

Status of the Razorback Sucker (Range-wide)

The razorback sucker, an endemic species unique to the Colorado River Basin, was historically abundant and widely distributed within warmwater reaches throughout the Colorado River Basin. Historically, razorbacks were found in the main stem Colorado River and major tributaries in Arizona, California, Colorado, Nevada, New Mexico, Utah, Wyoming, and in Mexico (Ellis 1914; Minckley 1973). Bestgen (1990) reported that this species was once so numerous that it was commonly used as food by early settlers, and further, that commercially marketable quantities were caught in Arizona as recently as 1949. In the Upper Basin, razorback suckers were reported in the Green River to be very abundant near Green River, Utah, in the late 1800s (Jordan 1891). An account in Osmundson and Kaeding (1989) reported that residents living along the Colorado River near Clifton, Colorado, observed several thousand razorback suckers during spring runoff in the 1930s and early 1940s.

The current distribution and abundance of razorback sucker has been significantly reduced throughout the Colorado River system (McAda 1987; McAda and Wydoski 1980; Holden and Stalnaker 1975; Minckley 1983; Marsh and Minckley 1989; Tyus 1987). The only substantial population of razorback suckers remaining, made up entirely of old adults (McCarthy and Minckley 1987), is found in Lake Mohave; however, they do not appear to be successfully recruiting. While limited numbers of razorback sucker persist in other locations in the lower Colorado River, they are considered rare or incidental and may be continuing to decline.

In the Upper Basin, above Glen Canyon Dam, razorback suckers are found in limited numbers in both lentic and lotic environments. The largest population of razorback suckers in the Upper Basin is found in the upper Green River and lower Yampa River (Tyus 1987). Lanigan and Tyus (1989) estimated that from 758 to 1,138 razorback suckers inhabit the upper Green River. In the Colorado River most razorback suckers occur in the Grand Valley area near Grand Junction, Colorado; however, they are increasingly rare. Osmundson and Kaeding (1991) report that the number of razorback sucker captures in the Grand Junction area have declined dramatically since 1974.

Specific information on biological and physical habitat requirements of the razorback sucker is very limited. Localized extirpation of razorback suckers from some localities, coupled with the species' continued decline in numbers and distribution, has prompted some research; however, details of its life history requirements, particularly in riverine environments, are still not fully understood.

In general, a natural hydrograph with a large spring peak, a gradually descending limb into early summer, and low stable flows through summer, fall, and winter are thought to create the best habitat conditions for razorback suckers. Prior to construction of large main stem dams and the suppression of spring peak flows, low velocity, off-channel habitats (seasonally flooded bottomlands and shorelines) were commonly available throughout the Upper Basin (Tyus and Karp 1989; Osmundson and Kaeding 1991). The absence of these seasonally flooded riverine habitats is believed to be a limiting factor in the successful recruitment of razorback suckers in their native environment (Tyus and Karp 1989; Osmundson and Kaeding 1991). Tyus (1987) and McAda and Wydoski (1980) reported springtime aggregations of razorback suckers in off-channel impoundments and tributaries; such aggregations are believed to be associated with reproductive activities. Tyus and Karp (1990) and Osmundson and Kaeding (1991) reported off-channel habitats to be much warmer than the main stem river and that razorback suckers presumably moved to these areas for feeding, resting, sexual maturation, spawning, and other activities associated with their reproductive cycle. While razorback suckers have never been directly observed spawning in turbid riverine environments within the Upper Basin, captures of ripe specimens, both males and females, have been recorded (Valdez et al. 1982; McAda and Wydoski 1980; Tyus 1987; Osmundson and Kaeding 1989; Tyus and Karp 1989; Tyus and Karp 1990; Platania 1990; Osmundson and Kaeding 1991) in the Yampa, Green, Colorado, and San Juan rivers. Sexually mature razorback suckers are generally collected on the ascending limb of the hydrograph from mid-April through June and are associated with coarse gravel substrates (depending on the specific location).

Outside of the spawning season, adult razorback suckers occupy a variety of shoreline and main channel habitats including slow runs, shallow to deep pools, backwaters, eddies, and other relatively slow velocity areas associated with sand substrates (Tyus 1987; Tyus and Karp 1989; Osmundson and Kaeding 1989; Valdez and Masslich 1989; Tyus and Karp 1990; Osmundson and Kaeding 1991).

The virtual absence of any recruitment suggests a combination of biological, physical, and/or chemical factors that may be affecting the survival and recruitment of early life stages of razorback suckers. Within the Upper Basin, recovery efforts endorsed by the "Recovery Implementation Program for Endangered Fish Species in the Upper Colorado River" (U.S. Fish and Wildlife Service 1987), include the capture and removal of razorback suckers from all known locations for genetic analyses and development of discrete brood stocks if necessary. These measures have been undertaken to develop refugium populations of razorback sucker from the same genetic parentage as their wild counterparts such that, if these fish are genetically unique by subbasin or individual population, then separate stocks will be available for future augmentation. Such augmentation may be a necessary step to prevent the extinction of razorback suckers in the Upper Basin.

Habitat requirements of young and juvenile razorback suckers in the wild are largely unknown, particularly in native riverine environments. Life stages, other than adults, have been extremely rare in the upper basin in recent times. One confirmed capture of razorback sucker juveniles in the upper basin was in the Colorado River near Moab, Utah (Taba et al. 1965). The only capture in recent years was the 1991 collection of two early juvenile razorback suckers in the lower Green River, 89.5 km above the confluence with the Colorado River (Gutermuth et al. 1994).

Status of the Razorback Sucker (In the Action Area)

In the San Juan River drainage, Platania and Young (1989) related historical accounts of razorback suckers ascending the Animas River to Durango, Colorado, around the turn of the century. Platania and Young (1989) also reported the 1976 capture of two adult razorback suckers by VTN Consolidated, Inc., from an irrigation pond adjacent to the San Juan River near Bluff, Utah.

In August 1990, the New Mexico Department of Game and Fish (Lief Ahlm, NMGF, pers. comm.) interviewed two anglers from Aztec, New Mexico, who claimed to have "commonly" caught razorback suckers in the Animas River near Cedar Hill bridge in the 1930s and 1940s. When the two men were shown a battery of photographs, including roundtail chub (*Gila robusta*), humpback chub (*Gila cypha*), bonytail (*Gila elegans*), bluehead sucker (*Pantosteus discobolus*), flannelmouth sucker (*Catostomus latipinis*), razorback sucker, and Colorado pikeminnow, they both immediately identified the razorback sucker as the fish they had caught. However, prior to the 1976 capture by VTN Consolidated, Inc., there were no scientifically verified reports of razorback sucker captures in the San Juan River drainage.

In the San Juan River subbasin, small concentrations of razorback suckers have been reported at the inflow area in the San Juan arm of Lake Powell, Utah (Meyer and Moretti 1988), and one specimen was captured in the San Juan River near Bluff, Utah, in 1988 (Platania 1990; Platania et al. 1991). In Bestgen (1990) additional captures of small numbers of razorback suckers also were reported from the Dirty Devil and Colorado River arms of Lake Powell.

Beginning in May 1987, and continuing through October 1989, complementary investigations of fishes in the San Juan River were conducted in Colorado, New Mexico, and Utah (Platania 1990; Platania et al. 1991). In 1987, a total of 18 adult razorbacks (6 recaptures) were collected on the south shore of the San Juan arm of Lake Powell (Platania 1990; Platania et al. 1991). These fish were captured near a concrete boat ramp at Piute Farms Marina and were believed to be either a spawning aggregation or possibly a staging area used in preparation for migration to some other spawning site. Of the 12 individual razorbacks handled in 1987, 8 were running ripe males while the other four specimens were females that appeared gravid.

In 1988, a total of 10 razorback suckers were handled at the same general location, 5 of which were in reproductive condition (Platania et al. 1991). Six of the ten individual specimens in the 1988 samples were recaptures from 1987. Also, in 1988, a single adult tuberculate male razorback sucker was captured at approximately river mile 80 on the San Juan River near Bluff, Utah. Particularly noteworthy is that this is the first confirmed record of this species from the main stem San Juan River. The presence of this reproductively mature specimen suggests that the razorback may be attempting to spawn in some unknown location within the riverine portion of the San Juan drainage. No razorback suckers were captured in 1989. No larval specimens, nor any other size classes of razorbacks (other than adults), have ever been documented in the San Juan River drainage.

All recent captures of wild razorback suckers in the upper basin have been mature adults. In 1994, an experimental augmentation program was initiated on the San Juan River; 30 radio tagged razorback suckers and 656 razorback suckers marked with passive integrated transponder tags were released in the San Juan River. There is no evidence from anywhere in the Colorado River system that indicates significant recruitment to any population of razorback sucker (Bestgen 1990, Platania 1990, Platania et al. 1991, Tyus 1987, McCarthy and Minckley 1987, Osmundson and Kaeding 1989).

The results of the experimental stocking discussed above led the San Juan Recovery Implementation Program to initiate a 5-year augmentation program for the razorback sucker in 1997 (Ryden 1997). In September 1997, as the initial step of that augmentation program, 2,885 subadult razorback suckers were stocked below Hogback Diversion Dam.

Critical Habitat

Critical habitat has been designated within the 100-year floodplain of the razorback sucker's historical range in the following section of the San Juan River Basin (59 FR 13374).

New Mexico, San Juan County; and Utah, San Juan County. The San Juan River from the Hogback Diversion in T. 29 N., R. 16 W., section 9 to the full pool elevation at the mouth of Neskahai Canyon on the San Juan arm of Lake Powell in T. 41 S., R. 11 E., section 26.

The Service has defined the primary constituent elements of critical habitat for both the Colorado pikeminnow and razorback sucker to be water, physical habitat, and the biological environment. Water includes a quantity of water of sufficient quality delivered to a specific location in accordance with a hydrologic regime required for the particular life stage of the endangered fishes. The physical habitat includes areas that are inhabited or are potentially habitable by the endangered fishes for use in spawning, nursery, feeding, rearing, or corridors between these areas. In addition to river channels, these areas also include bottom lands, side channels, secondary channels, oxbows, backwaters, and other areas in the 100-year floodplain, which when inundated provide habitat for the above uses. Food supply, predation, and competition are important elements of the biological environment. Food supply is a function of nutrient supply and productivity, which could be limited by reduction of high spring flows brought about by water depletions. Predation and competition from nonnative fish species have been identified as factors in the decline of the endangered fishes.

Water Quantity

The quantity of water in the San Juan River at any given time is, at a very gross level of analysis, a function of natural flow less the amount taken from the river by existing depletions on record. In identifying depletions to be considered within baseline conditions, the Service has relied upon the baseline conditions enumerated in the previous biological opinions issued for the Animas-La Plata Project (October 25, 1991; February 26, 1996) and the Navajo Indian Irrigation Project Blocks 1 through 8 (October 28, 1991; January 12, 1995). Pursuant to section 7 regulations, the baseline for these projects included: (1) the past and present impacts of Federal, State, and private actions in the basin; (2) the anticipated impacts of all Federal projects having previously undergone formal section 7 consultation in the area; and (3) the impact of State or private actions contemporaneous with the consultations. Since the completion of the two major consultations cited above, only three other actions resulting in depletions are known by the Service to have occurred on the San Juan River: the minor depletions account is at its ceiling of 3,000 acre-feet of depletions; Red Mesa Reservoir has undergone consultation on a new depletion of 1,000 acre-feet; and the City of Durango has completed consultation through the Corps of Engineers for a depletion of 1,051 acre-feet. Because the latter depletion had been included in the original request for the Animas-La Plata Project but was subsequently withdrawn from the project, the depletion amount for Animas-La Plata has been modified to reflect this changed condition. The total depletion remains the same for assessment of baseline conditions relevant to the status of the endangered fish; the amount has merely been divided to reflect the requested separate consultation for the City of Durango.

The Jicarilla Tribe strongly advocates the inclusion of the entirety of its adjudicated Indian Federal reserved water rights in the baseline. As a participant in this consultation, the Jicarilla Apache Tribe reviewed the San Juan environmental baseline (Table 2). This would extend beyond the Service's interpretations of depletions defined in section 7 regulations and amount to 25,500 acre-feet of "perpetual" federal contract depletions and 2,200 acre-feet of depletions for adjudicated historic and existing reserved rights. However, for the purposes of this intraService

section 7 consultation on the aggregate minor depletions account, and without waiving the right to assert on behalf of the Tribe a larger quantum of depletions for inclusion in other section 7 consultation environmental baselines, the Tribe has concurred with the Service's inclusion in this environmental baseline of the Jicarilla Apache Tribe's 2,200 acre-feet per year of historic and existing depletions from the San Juan River basin.

Based on the results of the 7 years of research under the San Juan Recovery Implementation Program, flows have been recommended for the recovery of the endangered fish. These flow conditions were analyzed under given conditions of "existing" depletion levels and under hypothetical future development of the water resources of the basin. It should be noted that the depletions tabulated above are those identified by the Service to establish the environmental baseline as required for consultation. The depletion estimates utilized in the flow recommendations have not been reviewed or agreed upon as reflective of actual depletions. In the absence of that clarification or determination for each of the estimated depletions, the Service continues to utilize the depletions of its environmental baseline included herein.

Water Quality

Information on existing water quality, summarized in Abell (1994), in the San Juan River has been derived from data gathered by the Department of the Interior as part of its National Irrigation Water Quality Program investigation of the San Juan River area in northeastern New Mexico (Blanchard et al. 1993), results from Reclamation's water quality data for the Animas-La Plata project, and ongoing contaminant monitoring and research conducted under the aegis of the San Juan Recovery Implementation Program.

Concentrations of organic and inorganic contaminants including selenium, polycyclic hydrocarbons (PAH), and a variety of inorganics are known to occur in the San Juan River (Wilson et al. 1995) (Blanchard et al. 1993) (Hamilton and Buhl 1995, 1996). These concentrations of contaminants are suspected to have adverse effects to fish reproduction, tissue damage, and survival of young (Wilson et al 1995) (Hickey et al. 1990) (Hamilton and Buhl 1995,1996).

Physical Habitat

The quantity and timing of flows influence how various habitats are formed and maintained. Water depletions reduce the ability of the river to create and maintain these habitats; degradation of water quality lessens the ability of endangered species to survive in these habitats.

Osmundson and Kaeding (1991) reported observations on the Colorado River (15-mile reach) during the drought years of 1988-1990, that backwaters were filling in with silt and sand because spring flows were not sufficient to flush out the fine sediment. Also they reported that tamarisk colonized sand and cobble bars, stabilizing the river banks. On the San Juan River, lack of flooding since Navajo Dam was completed has caused establishment of exotic riparian vegetation (tamarisk and Russian olive) that has armored the channel banks resulting in a narrowing of the channel with reduced flood capacity (Bliesner and Lamarra 1994).

As previously stated, Colorado pikeminnow spawn July 1 to September 1 in cobble/gravel areas typically found in riffle/run habitats. Following hatch, larval Colorado pikeminnow drift downstream to low velocity habitats. Important habitats during summer low flow (August) are the San Juan's backwaters and secondary channels, used by larvae and young Colorado pikeminnow.

Biological Environment

Food supply, predation, and competition are important elements of the biological environment. Food supply is a function of nutrient supply and productivity, which could be limited by the presence of contaminants. Predation and competition from nonnative fishes has been identified as a factor in the decline of the endangered fishes. Depending upon species-specific tolerance levels, nonnative fishes may have competitive advantages in habitats damaged by the presence of contaminants and altered flow regimes.

Southwestern Willow Flycatcher

Status of the southwestern willow flycatcher (Range-wide)

The southwestern willow flycatcher is a small passerine bird (Order Passeriformes; Family Tyrannidae). The flycatcher is an insectivore which typically perches on branches and makes short direct flights, or sallies, to capture flying insects. The flycatcher is a riparian obligate, nesting along rivers, streams, and other wetlands where dense growths of willow (*Salix* sp.), *Baccharis*, buttonbush (*Cephalanthus* sp.), box elder (*Acer negundo*), saltcedar (*Tamarix* sp.) or other plants are present, often with a scattered overstory of cottonwood (*Populus* sp.) and/or willow.

The historical range of the flycatcher included southern California, Arizona, New Mexico, western Texas, southwestern Colorado, southern Utah, extreme southern Nevada, and extreme northwestern Mexico (Sonora and Baja) (Unitt 1987). The States of California (California Department of Fish and Game 1992) and New Mexico (New Mexico Department of Game and Fish 1998) list the flycatcher as endangered. The State of Arizona considers the flycatcher a species of special concern (Arizona Game and Fish Department 1996). A final rule listing this species as endangered was published on February 27, 1995, (Fish and Wildlife Service 1995), becoming effective on March 29, 1995. Final determination of the critical habitat was published on July 22, 1997, and became effective on August 21, 1997. A correction notice was published in the Federal Register on August 20, 1997.

The Service designated critical habitat for this species in areas that contain the remaining known flycatcher nesting areas, and/or formerly supported nesting flycatchers, and/or have the potential to support nesting flycatchers. These areas contain, or with recovery will contain, suitable nesting habitat in a patchy, discontinuous distribution. This distribution is partially the result of

natural regeneration patterns of riparian vegetation and is expected to shift over time. All of these areas contain some unoccupied habitat or former (degraded) habitat that is needed to recover ecosystem integrity and support larger flycatcher numbers.

The Service designated flycatcher critical habitat in areas which provide, or with rehabilitation will provide, the following biological and physical features: space, food, water, air, light, sites for breeding, reproduction, and rearing, cover, shelter, habitats representative of the historic geographical and ecological distribution of the species, etc. Constituent habitat elements are provided by thickets of riparian shrubs and small trees and adjacent surface water (i.e., surface water that is present throughout the May through September breeding season). Constituent elements include the riparian ecosystem above the water's surface or within 328 ft (100 m) of the water's edge, or areas where suitable vegetation may become established.

Activities that could cause destruction or adverse modification of flycatcher critical habitat include: 1) removal, thinning, or destruction of riparian vegetation; 2) water diversion or impoundment, groundwater pumping, or other activities that may alter the quantity or quality of surface or subsurface flow; 3) destruction /alteration of habitat by discharge of fill material, draining, ditching, tiling, pond construction, and stream channelization; 4) overstocking of livestock; and 5) increases in recreation or human-induced disturbances.

Eighteen critical habitat units were designated, totaling 599 river mi (964 km) in Arizona, California, and New Mexico. In New Mexico, areas of land and water are designated as follows: Gila River and the East and West Forks of the Gila River, Catron and Grant counties; Gila River, confluence of Hidden Pasture Canyon to confluence of Steeple Rock Canyon, Grant and Hidalgo counties (T18S, R21W, S33); San Francisco River from the confluence of Trail Canyon, Catron County (T6S, R20W, S4) to San Francisco Hot Springs (T12S, R20W, S23); and Tularosa River and Apache Creek from the confluence of the Tularosa River and San Francisco Rivers (T7S, R19W, S23) to source of Tularosa River (T4S, R15W, S33) and upstream from Apache Creek to the confluence with Whiskey Creek (T4S, R18W, S25) Catron County. The boundaries include areas within 328 ft (100 m) of the edge of areas with surface water during the May to September breeding season and within 328 ft (100 m) of areas where such surface water no longer exists owing to habitat degradation but may be recovered with habitat rehabilitation.

Life History

The southwestern willow flycatcher forages within and above dense riparian vegetation, taking insects on the wing or gleaning them from foliage (Wheelock 1912; Bent 1963). No information is available on specific prey species.

The flycatcher invariably nests near surface water or saturated soil (Phillips *et al.* 1964; Muiznieks *et al.* 1994). Surface water is usually present within 328 ft (100 m) of any active nest throughout the nesting season (Muiznieks *et al.* 1994). Riparian habitats not selected for either nesting or singing are generally narrower, with greater distances between willow patches and

individual willow plants (Sedgwick and Knopf 1992). Appropriate hydrology, natural flood regimes (periodic flooding), and a stable, high water table are essential to creating and maintaining flycatcher habitat.

Cowbird parasitism and nest depredation are affecting southwestern willow flycatchers throughout their range. Cowbirds have been documented at more than 90% of sites surveyed (Sogge and Tibbitts 1992; Sogge *et al.* 1993; Camp Pendleton 1994; Muiznieks *et al.* 1994; Sogge and Tibbitts 1994; T. Ireland 1994 *in litt.*; Whitfield 1994; C. Tomlinson 1995 *in litt.*; Griffith and Griffith 1995; Holmgren and Collins 1995; Kus 1995; Maynard 1995; McDonald *et al.* 1995; Sferra *et al.* 1995; Cooper 1996; San Diego Natural History Museum 1995; Stransky 1995; Whitfield and Strong 1995; Griffith and Griffith 1996 *in litt.*; Skaggs 1996; Spencer *et al.* 1996). Thus, the potential for cowbirds to be a persistent and widespread threat remains high. Cowbird trapping has been demonstrated to be an effective management strategy for increasing reproductive success for the flycatcher as well as for other endangered passerines (e.g., least Bell's vireo, black-capped vireo, golden-cheeked warbler). It may also benefit juvenile survivorship by increasing the probability that parents fledge birds early in the season. Expansion of cowbird management programs has the potential to not only increase reproductive output and juvenile survivorship at source populations, but also to potentially convert small, sink populations into breeding groups that contribute to population growth and expansion.

The flycatcher breeds in dense riparian habitats from sea level in California to over 7,000 ft (2,133 m) in Arizona and southwestern Colorado. Throughout its wide geographic and elevational range, its riparian habitat can be broadly described based on plant species composition and habitat structure (Sogge *et al.* 1997). Photographs and accompanying text provided in Sogge *et al.* (1997) characterize the considerable variation in habitat structure and plant species composition found at breeding sites throughout the flycatcher's range. Two components that vary less across this subspecies' range are vegetation density and the presence of surface water. Characteristics of actual breeding sites fall somewhere on a continuum from monotypic to multiple plant species, and from a relatively simple habitat structure characterized by a single vegetation stratum to more complex habitat patches characterized by multiple strata.

The size and shape of occupied riparian habitat patches vary considerably. Southwestern willow flycatchers have been found nesting in patches as small as 2 acres (0.8 ha) (e.g., Grand Canyon) and as large as several hundred hectares (e.g., Roosevelt Lake, Lake Mead). When viewed from above, the mixed vegetation types in particular often appear as a mosaic of plant species and patch shapes and sizes. In contrast, narrow, linear riparian habitats one or two trees wide do not appear to contain attributes attractive to nesting flycatchers. However, flycatchers have been found using these habitats during migration.

Open water, cienegas, marshy seeps, or saturated soil are typically in the vicinity of flycatcher territories and nests; flycatchers sometimes nest in areas where nesting substrates are in standing water (Maynard 1995; Sferra *et al.* 1995, 1997). However, hydrological conditions at a particular site can vary remarkably in the arid Southwest within a season and between years. At some

locations, particularly during drier years, water or saturated soil is only present early in the breeding season (i.e., May and part of June). However, the total absence of water or visibly saturated soil has been documented at several sites where the river channel has been modified (e.g., creation of pilot channels), where modification of subsurface flows has occurred (e.g., agricultural runoff), or as a result of changes in river channel configuration after flood events (Spencer *et al.* 1996).

Unitt (1987) reviewed historical and contemporary records of *E.t. extimus* throughout its range, determining that it had "declined precipitously..." and that although the data reveal no trend in the past few years, the population is clearly much smaller now than 50 years ago, and no change in the factors responsible for the decline seem likely.

Population Dynamics/Status and Distribution

The data presented in Table 3 represent a composite of surveys conducted from 1993-1995, a state-by-state comparison of historic and current data for the flycatcher. Since 1992, more than 800 historic and new locations have been surveyed range-wide to document the status of the southwestern willow flycatcher (some sites in southern California have been surveyed since the late 1980s. The extensive and, in some cases, intensive nature of these surveys have provided a critical baseline for the current distribution, abundance, and reproductive success of flycatchers range-wide.

Range-wide, the current known population of flycatchers stands at approximately 450 territories (Table 3). These results indicate a critical population status; more than 75 percent of the locations where flycatchers have been found are composed of 5 or fewer territorial birds and up to 20 percent of the locations are comprised of single, unmated individuals. The distribution of breeding groups is highly fragmented, with groups often separated by considerable distances. Survey results reveal a consistent pattern range-wide: the flycatcher population as a whole is composed of extremely small, widely-separated breeding groups or unmated individuals.

The figure of 454 flycatcher territories is an approximation based on considerable survey effort, both extensive and intensive. Given sampling errors that may bias population estimates positively or negatively (e.g., incomplete survey effort, double-counting males/females, composite tabulation methodology), natural population fluctuation, and random events, it is likely that the total population of flycatchers is fluctuating at between 300 and 500 territories with a substantial proportion of individuals remaining unmated. If all extant sites were fully protected, at such low population levels random demographic, environmental, and genetic events could lead to extirpation of breeding groups and eventually render this species extinct. The high proportion of unmated individuals documented during recent survey efforts suggests the flycatcher may already be subject to a combination of these factors (e.g., uneven sex ratios, low probability of finding mates in a highly fragmented landscape).

California

The historic range of southwestern willow flycatchers in California apparently included all lowland riparian areas in the southern third of the State. It was considered a common breeder where suitable habitat existed (Wheelock 1912; Willett 1912, 1933; Grinnell and Miller 1944). Survey and monitoring efforts since the late 1980s have confirmed flycatcher presence at 18 locations on 11 drainages in southern California (including Colorado River). Current known flycatcher breeding sites are restricted to four counties, San Diego, Riverside, Santa Barbara, and Kern. Combining survey data for all sites surveyed since the late 1980s for a composite population estimate, the total known flycatcher population in southern California is 114 territories (Table 3).

Arizona

Historic records for Arizona indicate the former range of the flycatcher included portions of all major river systems (Colorado, Salt, Verde, Gila, Santa Cruz, and San Pedro) and major tributaries, such as the Little Colorado River and headwaters, and White River. Unitt (1987) noted that "probably the steepest decline in the population levels of *E.t. extimus* has occurred in Arizona." The bird has been extirpated, or virtually extirpated from the Santa Cruz River (Pima Co.), upper San Pedro River (Cochise Co.), lower San Pedro River at PZ Ranch (Pinal Co.), Blue River (Greenlee Co.), Colorado River at Lees Ferry (Coconino Co.), Colorado River (Yuma Co.), Gila River (Yuma Co.), and Verde River at Tuzigoot Bridge (Yavapai Co.). Currently, 150 territories are known from 39 sites along 9 drainages statewide, including the Colorado River (Table 3).

New Mexico

Unitt (1987) considered New Mexico as the state with the greatest number of *E.t. extimus* remaining. After reviewing the historic status of the flycatcher and its riparian habitat in New Mexico, Hubbard (1987) concluded, "[it] is virtually inescapable that a decrease has occurred in the population of breeding willow flycatchers in New Mexico over historic time. This is based on the fact that wooded sloughs and similar habitats have been widely eliminated along streams in New Mexico, largely as a result of the activities of man in the area."

Unitt (1987), Hubbard (1987), and more recent survey efforts have documented very small numbers and/or extirpation in New Mexico on the San Juan River (San Juan Co.), near Zuni (McKinley Co.), Blue Water Creek (Cibola Co.), and Rio Grande (Doña Ana Co. and Socorro Co.). Survey and monitoring efforts from 1993-1995 documented approximately 173 to 214 flycatcher territories on 8 drainages (Table 3). A 1997 report (Parker 1997) documented 138 pairs (territories) along the Gila River in Grant County in 1996 and 174 pairs (territories) in 1997. Parker asserts that the results of four consecutive years of population surveys conducted upstream and downstream of New Mexico Highway 211 bridge of 64 pairs in 1994, 107 pairs in 1995, 138 pairs in 1996, and 174 pairs in 1997 show an expansion in this population. However, Skaggs (1996) saw no evidence of population trends because differences in survey objectives,

methods, area, and levels of effort made comparisons inappropriate. Net increases may be due to an increased level of survey effort. Even though conclusions about population trend cannot be made without repeated and methodologically consistent surveys over a span of perhaps 5 to 10 years, the various surveys clearly indicate the area has been, and remains, a significant regional stronghold for the species (Skaggs 1996).

Texas

The Rio Grande and Pecos River in western Texas are considered the easternmost boundary for the southwestern willow flycatcher. Unitt (1987) found specimens from four locations in Brewster, Hudspeth (Rio Grande), and Loving (Pecos River) counties where the subspecies is no longer believed to be present. Landowner permission to survey riparian areas on private property has not been obtained; thus current, systematic survey data are not available for Texas. There have been no other recent reports, anecdotal or incidental, of flycatcher breeding attempts in the portion of western Texas where the subspecies occurred historically. It is unknown at this time whether the flycatcher has been extirpated from Texas, but it is unlikely that there are significant numbers to be found there.

Colorado

The taxonomic status and the historic distribution and abundance of flycatchers in southwestern Colorado remain unclear due to a lack of specimen data and breeding records. Preliminary data on song dialects suggest that the few birds recently documented in southwestern Colorado may be *E.t. extimus*. These sightings have prompted State and Federal agencies to delineate provisional boundaries for flycatchers and sponsor statewide survey efforts. Survey efforts since 1993 have documented a total of six locations in Delta, Mesa, and San Miguel counties where flycatchers have been found (Table 3).

Utah

Specimen data reveal that southwestern willow flycatcher historically occurred in southern Utah along the Colorado River, San Juan River, Kanab Creek, Virgin River, and Santa Clara River (Unitt 1987). The northern boundary in south-central Utah remains unclear due to a lack of specimen data from that region. The flycatcher no longer occurs along the Colorado River in Glen Canyon where Lake Powell inundated historically-occupied habitat, nor in unflooded portions of Glen Canyon near Lee's Ferry where flycatchers were documented nesting in 1938. Similarly, recent surveys on the Virgin River and tributaries and Kanab Creek have failed to document their presence (McDonald *et al.* 1995). The population totals for Utah are summarized in Table 3.

Nevada

Unitt (1987) documented three locations in Clark County from which southwestern willow flycatchers had been collected, but not found after 1970. Current survey efforts have documented a single location with two unmated males on the Virgin River in Clark County (Tomlinson *in litt.*; Table 3).

Status of the southwestern willow flycatcher (in the action area)

Historically the southwestern willow flycatcher nested along the major river systems in northern New Mexico, but many activities have profoundly influenced the riparian habitat along the water courses. During the late 1800s, large numbers of sheep and cattle grazed throughout the area, but habitat conversion has not occurred solely as a result of grazing impacts. Disruption of water flows due to large dams, smaller diversion dams, and pumping for irrigation has severely affected the timing and rates of water discharge. This has affected reproduction of native species and made habitat more favorable for exotics. In addition, overstory cottonwoods were physically removed in the desire to add more water to the drainages; resulting in open canopy conditions that were ideal for salt cedar establishment. These and other activities have profoundly influenced the riparian habitat along the water courses within the San Juan Basin. Much of the area is a checkerboard land ownership pattern involving private lands, State lands and Indian tribal lands and lands managed by Federal entities (Bureau of Reclamation, Bureau of Land Management, Forest Service, National Park Service).

The species is known to nest in northern New Mexico; Hubbard (1987) documented reports of singing flycatchers near Farmington, New Mexico, but it was assumed that they were migrants. Several areas along the San Juan, Animas, and La Plata rivers have potential habitat. Five years of survey have been completed on potential habitat on public lands administered in the project area by the Bureau of Land Management's (BLM) Farmington Office, according to the Service protocol guidelines, but no nesting pairs have been located. The large areas of private riparian are not surveyed by BLM personnel, but permission was granted to U.S. Geological Survey (USGS) biologists in 1994 to survey some of the private frontage. Flycatchers were observed singing on the USGS surveys, but they left the area and were considered to be migrating through the region. These singing birds were found a few weeks before the nesting period specified in the survey protocol. In late June 1995, a lone, singing male was noted during a BLM survey. The site was revisited the next day and no response was heard. No nest was found and it was determined that this bird was probably still a migrant (even though the timeframe of the survey was within the protocol).

In 1997, habitat evaluation and presence/absence surveys for the flycatcher were conducted by Ecosphere Environmental Services under contract to the Department of the Interior. One nesting pair of southwestern willow flycatchers was documented on lands of the Navajo Nation along the San Juan River. One bird, believed to be a brown-headed cowbird, was fledged by this pair (M. Fitzgerald. 1998. Ecosphere Environmental Services, Inc., *in litt.*). In 1998, 25 areas were

surveyed by Ecosphere (M. Fitzgerald. 1998, in litt.) along the San Juan River through New Mexico for presence/absence of the flycatcher. Four southwestern willow flycatcher nests were found on Navajo lands. It is believed that three females and a single male comprise the breeding population. Of the four nests, one was destroyed during a windstorm, killing one egg; two other nests successfully fledged two flycatchers each. The fate of the clutch of the fourth nest is unknown.

Effects of the Action

Of primary concern to the endangered fish is the quantity of water provided to and through the habitat of the Colorado pikeminnow and razorback sucker in the San Juan River. Prior to the 7 years of research on the response of the endangered fish to flows in the river, little information was available concerning the amounts of water necessary for the well-being of the species. Thus, given the extremely low population levels and the existing status of the fish in the San Juan, all depletions were considered jeopardy in past biological opinions on the fish.

Water depletions in the San Juan River Basin have been recognized as a major source of impact to endangered fish species. Historic water depletions and regulation have been cited as primary reasons for listing the species under the Endangered Species Act. Continued water withdrawal and manipulation of the flows of the San Juan have restricted the ability of the San Juan River system to produce flow conditions required by various life stages of the fishes. In 1963, the Navajo Dam was closed, and Navajo Reservoir began to fill with water from the San Juan River. Historically, flows in the San Juan River prior to Navajo Dam were highly variable and ranged from a low of 44 cubic feet per second (cfs) in September 1956, to a high of 19,790 cfs in May 1941, (mean monthly values) at the USGS Station 93680000, Shiprock, New Mexico. Conversely, post-Navajo Dam flows in the San Juan River have ranged from a low of 185 cfs in July 1963, while the reservoir was filling, to a high of 9,508 cfs in June 1979. According to the Bureau of Reclamation, since 1963, Navajo Dam has significantly altered flow of the San Juan River by typically storing spring peak flows and releasing water in summer, fall, and winter months resulting in an average decrease in spring peak flows of 45 percent, while approximately doubling winter base flows at the Bluff gauge in Utah. Similar comparisons can be made at the upstream gauges at Shiprock and Farmington, New Mexico. Significant depletions and redistribution of flows of the San Juan River also have occurred as a result of other major water development projects, including Navajo Indian Irrigation Project and the San Juan-Chama Project. These depletions, together with similar depletions from other rivers occupied by the species and a number of other factors, have resulted in such drastic reductions in the populations of Colorado pikeminnow and razorback sucker throughout their ranges that the Service listed these species as endangered and has implemented programs to prevent them from becoming extinct.

The following flows have been recommended by the San Juan River Recovery Implementation Program's Biology Committee and accepted by the Coordination Committee for implementation on the river for the endangered fish:

A. Flow >10,000 cubic feet per second (cfs) during runoff period (March 1 to July 31)

Minimum duration - 5 days

Frequency 20 percent on average. Maximum period without meeting at least 97 percent of the specified conditions is 10 years.

Purpose - Flows above 10,000 cfs provide significant out-of-bank flow, generate new cobble sources, change channel configuration providing for channel diversity, and provide nutrient loading to the system, thus improving habitat productivity. Such flows provide material to develop spawning habitat and maintain channel diversity and habitat complexity necessary for all life stages of the endangered fishes. The frequency and duration are based on mimicry of the natural hydrograph, which is important for Colorado pikeminnow reproductive success and maintenance of channel complexity, as evidenced by the increase in the number of islands following high flow conditions. Channel complexity is important to both Colorado pikeminnow and razorback sucker.

B. Flow > 8,000 cfs during runoff period.

Minimum duration - 10 days

Frequency 33 percent on average. Maximum period without meeting at least 97 percent of the specified conditions is 6 years.

Purpose - Bankfull discharge is generally between 7,000 and 10,500 cfs in the San Juan River below Farmington, New Mexico, with 8,000 cfs being representative of the bulk of the river. Bankfull discharge approximately 1 year in 3 on average is necessary to maintain channel cross-section. Flows at this level provide sufficient stream energy to move cobble and build cobble bars necessary for spawning Colorado pikeminnow. Duration of 8 days at this frequency is adequate for channel and spawning bar maintenance. However, research shows a positive response of bluehead sucker and speckled dace abundance with increasing duration of flows above 8,000 cfs from 0 to 19 days. Therefore, the minimum duration was increased from 8 to 10 days to account for this measured response. Flows above 8,000 cfs may be important for providing habitat for larval razorback sucker if flooded vegetation and other habitats formed during peak and receding flows are used by the species. This flow level also maintains mimicry of the natural hydrograph during higher flow years, an important feature for Colorado pikeminnow reproductive success.

C. Flow > 5,000 cfs during runoff period

Minimum duration - 21 days

Frequency 50 percent on average. Maximum period without meeting at least 97 percent of the specified conditions is 4 years.

Purpose - Flows of 5,000 cfs or greater for 21 days are necessary to clean backwaters and maintain low-velocity habitat in secondary channels in Reach 3, thereby maximizing nursery habitat for the system. The required frequency of these flows is dependent upon perturbing storm events in the previous period, requiring flushing in about 50 percent of the years on average. Backwaters in the upper portion of the nursery habitat range clean with less flow but may be too close to spawning sites for full utilization. Maintenance of Reach 3 is deemed critical at this time because of its location relative to the Colorado pikeminnow spawning area (river mile 132) and its backwater habitat abundance.

D. Flow > 2,000 cfs during runoff period

Minimum duration - 10 days

Frequency 80 percent on average. Maximum period without meeting at least 97 percent of the specified conditions is 2 years.

Purpose - Flows above 2,500 cfs cause cobble movement in higher gradient areas on spawning bars. Flows above 2,500 cfs for 10 days provide sufficient movement to produce clean cobble for spawning. These conditions also provide sufficient peak flow to trigger spawning in Colorado pikeminnow. The frequency specified represents a need for frequent spawning conditions but recognizes that it is better to provide water for larger flow events than to force a release of this magnitude each year.

E. Peak timing similar to historical conditions, including variability.

Timing - Mean peak with reoperation of Navajo Dam to be within 5 days +/- of historical period mean.

Variability - Standard deviation of date of peak to be 14 to 25 days.

Purpose - Maintaining similar peak timing will provide ascending and descending hydrograph limbs similar to the historical conditions that are suspected important for spawning of the endangered fish.

F. Target Base Flow (mean weekly nonspring runoff flow).

Level - 500 cfs from Farmington to Lake Powell, with 250 cfs minimum from Navajo Dam

Purpose - maintaining low, stable base flows enhances nursery habitat conditions. Flows between 500 and 1,000 cfs optimize backwater habitat. Selecting flows at the low end of the range increases the availability of water for development and spring releases. It also provides capacity for storm flows to increase flows and still maintain optimum backwater area. This level of flow balances provision of near-maximum low-velocity habitat and near-optimum flows in secondary channels, while allowing water availability to maintain the required frequency, magnitude, and duration of peak flows important for Colorado pikeminnow reproductive success.

G. Flood Control Releases (incorporated in operating rules for Navajo Dam)

Control: Handle flood control releases as a spike (high magnitude, short duration) and release when flood control rules require, except that the release shall not occur earlier than September 1. If an earlier release is required, extend the duration of the peak of the release hydrograph. A ramp up and ramp down of 1,000 cfs per day should be used to a maximum release of 5,000 cfs. If the volume of water to release is less than that required to reach 5,000 cfs, adjust the magnitude of the peak accordingly, maintaining the ramp rates. Multiple releases may be made each year. These spike releases shall be used in place of adjustments to base flow.

Purpose - Historically, flood control releases were made by increasing fall and winter base flows. This elevates flows above the optimum range for nursery habitat. Periodic clean-water spike flows improve low-velocity habitat quality by flushing sediment and may suppress red shiner and fathead minnow abundance.

Destruction or adverse modification of critical habitat is defined in 50 CFR 402.02 as a direct or indirect alteration that appreciably diminishes the value of critical habitat for both the survival and recovery of listed species. In considering the biological basis for designating critical habitat, the Service focused on the primary physical and biological elements that are essential to the conservation of the species without consideration of land or water ownership or management. The Service has identified water, physical habitat, and biological environment as the primary constituent elements. This includes a quantity of water of sufficient quality that is delivered to a specific location in accordance with a hydrologic regime that is required for the particular life stage for each species. Water depletions reduce the ability of the river system to provide the required water quantity and hydrologic regime necessary for recovery of the fishes. The physical habitat includes areas of the San Juan River system below Farmington, New Mexico, that are inhabited or potentially habitable for use in spawning and feeding, as a nursery, or serve as corridors between these areas. In addition, oxbows, backwaters, and other areas in the 100-year floodplain, when inundated, provide access to spawning, feeding, and nursery habitats. Water depletions reduce the ability of the river to create and maintain these important habitats. Even small depletions at critically low flow periods, when combined with existing stress to larval and

young-of-year life stages can increase habitat overlap and competition with nonnative species also utilizing the side channel habitats occupied by the endangered fish species. Food supply, predation, and competition are important elements of the biological environment. Food supply is a function of nutrient supply and productivity, which could be limited by reduction of high spring flows brought about by water depletions. Predation and competition from nonnative fish species have been identified as a factor in the decline of the endangered fishes. Water depletions contribute to alterations in flow regimes that favor nonnative fishes.

The physical and biological features that were the basis for designating the critical habitat for the endangered fishes are water, physical habitat, and biological environment. These primary constituent elements were determined necessary for survival and recovery of the endangered fishes in the San Juan River. The primary constituent element water is described as a quantity of sufficient quality and with a hydrologic regime that is required for each life stage. Physical habitat includes areas of the river that are inhabited or potentially habitable by endangered fishes for use in spawning, nursery, feeding, and rearing or corridors between these areas. Biological environment includes food supply, predation, and competition.

Because water depletions have been determined to constitute a major factor in the decline of the endangered fishes, and based on the best available scientific information, the Service determined in previous biological opinions that any depletion would jeopardize their continued existence and would likely contribute to the destruction or adverse modification of their critical habitat. Included in these depletions are numerous small depletions of 100 acre-feet or less. The aggregate impact of all these small depletions causes an adverse impact, even though the individual depletions in and of themselves are minimal because of their size and scattered locations. A review of the depletions that have occurred during the past 6 years of consultation on the San Juan River reveals that none of the individual actions would have the capacity to significantly affect the volume of flow in the river. As an aggregate, the 3,000 acre-feet in depletion are analyzed in the context of the flows that will be maintained in the San Juan River based on the 1998 recommendations of the Program, and the amount of water remaining for development that would not affect or limit the provision of the flows for the endangered fish. Based on the flow recommendations, with the existing depletions (although there is still significant debate concerning the accuracy and adequacy of the modeling of those depletions), sufficient water is in the basin to meet the flow magnitudes, durations, or frequencies required for conservation of the Colorado pikeminnow and razorback sucker. The current modeling has also shown that, after meeting the needs of the endangered fish, thereby contributing to recovery of the fish, water remains for development. The 3,000 acre-feet utilized for this consultation will be subtracted from that amount, leaving a still significant amount of water available for development.

The proposed action will result, at full development of all individual water depletions, in an annual depletion of 3,000 acre-feet from the San Juan River. For this action, no depletion by itself will exceed 100 acre-feet. Additionally, based on the consultation record of the past 6 years, the majority of these depletions will not be direct diversions of the San Juan's flow, but

rather water development higher in the watershed that reduces runoff to the river via its tributaries. These essentially unmeasurable depletions of 100 acre-feet at any one place and time represent minute portions of the river's flow on an individual basis. However, each adds to the aggregate total of depletions of the river; thereby adding to the aggregate impact to the endangered fish species. Diminished flows, even at a minimal level anticipated from the anticipated individual depletions, affect the availability and suitability of already limited low flow habitats needed by larval and young-of-year endangered fishes. However, the aggregate depletion of 3,000 acre-feet will not diminish the capability of the system to meet the flow levels, durations, or frequencies approved by the San Juan Program for the recovery of the endangered fish species. When water was identified as a primary constituent element for critical habitat for the endangered Colorado pikeminnow and razorback sucker, it was described as a sufficient quantity of sufficient quality at the needed time for the life stages of the species. The flow recommendations, in quantifying amounts, identifying frequencies, and determining durations, have addressed those descriptors of water needed for critical habitat. The use of 3,000 acre-feet of the identified water remaining in the system after flow recommendations are met, will not affect the sufficiency of water for maintenance of critical habitat.

Based upon the review of minor depletions that occurred over the past 7 years, the majority of the depletions were at some distance from the mainstem of the San Juan, and without a discharge back to the river that would bring with it contaminants derived from the use of the water. The only effect on water quality was the lessening, in minute quantities, of the flow of the river and its capacity to dilute existing element loads. It is anticipated that the depletions considered under the new 3,000 acre-feet account would be similar to those previous actions. The comparative effects to water quality, when considering the effect of a 100 acre-feet depletion on the flow of the San Juan are not expected to be detectable. The diminution of flows in the river by the amount needed for the future aggregate depletion of 3,000 acre-feet, with no one individual depletion exceeding 100 acre-feet, is not expected to affect the water quality of the river. However, in the review of each application for a depletion, the Service will assess whether the actions dependent upon and resulting from the depletion would have water quality impacts that would need to be addressed individually. If such circumstances exist, the proposed action would not be considered eligible for inclusion in the minor depletions account. This has occurred once in the past 7 years wherein a relatively minor depletion supported oil and gas activities that have been linked to the presence of contaminants in the San Juan River. That consultation required a specific reasonable and prudent alternative in the contract for the sale of the water that addressed the particular impacts of the project. It is anticipated that other such proposed actions would be consulted upon in a like manner.

Individual depletions totaling 3,000 acre-feet along the San Juan River are not expected to result in discernible changes in habitat quality for the southwestern willow flycatcher. Impacts other than those arising from these depletions are not addressed in this consultation and must undergo individual analysis and assessment for impacts upon the flycatcher.

Cumulative Effects

Cumulative effects include the effects of future State, local, or private activities that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Given the high degree of federal involvement in the development of water resources within the San Juan Basin, actions carried out by non-federal entities that would affect the endangered fish species are considered negligible.

In accordance with the Recovery Implementation Program Document, the Service assessed the impacts of the proposed action in light of the progress made toward recovery of the endangered fish by the Program. The evaluation by the Service to determine if sufficient progress has been achieved considered the following:

(a) actions which result in a measurable population response, a measurable improvement in habitat for the fishes, legal protection of flows needed for recovery, or a reduction in the threat of immediate extinction; (b) status of fish populations; (c) adequacy of flows; and (d) magnitude of the project impact. In addition, the Service considered support activities (funding, research, information and education, etc.) of the Recovery Program if they help achieve a measurable population response, a measurable improvement in habitat for the fishes, legal protection of flows needed for recovery, or a reduction in the threat of immediate extinction. The Service evaluated progress separately for the Colorado River and Green River subbasins; however, it gave due consideration to progress throughout the Upper Basin in evaluating progress toward recovery. The Service has identified elements of the Plan and has made recommendations for changes in the Plan so that it could also serve as the reasonable and prudent alternative to avoid adverse modification to critical habitat by water depletions.

The Bureau of Reclamation, in the 1996 consultation on the proposed Animas-La Plata Project, committed to operating Navajo Dam to mimic the natural hydrograph of the San Juan River. This reoperation commitment, in reestablishing the natural pulse of the river for the benefit of the endangered fish species and their habitat, served as the reasonable and prudent alternative for the effects of minor depletions up to the annual cap of 3,000 acre-feet from 1992 to 1996. As an integral part of the Recovery Program, the reoperation of Navajo Dam was also considered in weighing the impacts of facilitating an additional multi-user depletion of 3,000 acre-feet (anticipated to occur over a similar span of years). Additionally, the commitment to deliver flows in the quantities, durations, and frequencies outlined in the Flow Recommendations Report and accepted by the San Juan Recovery Implementation Program's Coordination Committee has significantly addressed the baseline status of the endangered fish. As flows are provided for recovery of the species, the avoidance of jeopardy is realized.

CONCLUSION

After reviewing the current status of the Colorado pikeminnow, razorback sucker, and southwestern willow flycatcher, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the Service's biological opinion that the proposed depletion of a total of 3,000 acre-feet for projects not exceeding 100 acre-feet on an individual basis is not likely to jeopardize the continued existence of the Colorado pikeminnow, razorback sucker, or southwestern flycatcher, and is not likely to destroy or adversely modify designated critical habitat.

INCIDENTAL TAKE STATEMENT

Section 9 of the Endangered Species Act, as amended, prohibits any taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species without a special exemption. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered taking within the bounds of the Endangered Species Act provided that such taking is in compliance with the incidental take statement.

The Service does not anticipate that the depletion of 3,000 acre-feet from the flow of the San Juan River will result in any incidental take of Colorado squawfish, razorback sucker, or southwestern willow flycatcher.

REINITIATION - CLOSING STATEMENT

This concludes formal consultation on the impacts of the proposed depletion of up to 3,000 acre-feet annually from the San Juan River. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained or is authorized by law and if: (1) the amount or extent of anticipated incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

If you have any questions concerning this opinion, please contact this office.

cc:

Chairman, Southern Ute Indian Tribe
President, Jicarilla Apache Indian Tribe
Chairman, Ute Mountain Ute Indian Tribe
President, Navajo Nation
Area Director, Bureau of Indian Affairs
Regional Solicitor, U.S. Department of the Interior, Albuquerque, New Mexico
Regional Director, Fish and Wildlife Service, Mountain and Prairie Region,
Denver, Colorado
Supervisor, Fish and Wildlife Service Ecological Services Field Office, Grand Junction,
Colorado Ecological
Supervisor, Fish and Wildlife Service, Ecological Services Field Office, Salt Lake City, Utah
GARD, AZ/NM
Project Leader, New Mexico Fishery Resources Office, Fish and Wildlife Service,
Native American Liaison, Fish and Wildlife Service, Southwest Region, Albuquerque,
New Mexico
Ms. Jessica Aberly, Nordhaus, Haltom, Taylor, Taradash & Frye
Mr. Scott McElroy, Greene, Meyer & McElroy
Mr. Dan Israel
Mr. Stanley Pollack, Special Counsel for Water Rights, Navajo Nation Department of
Justice

Minor Depletions, San Juan River
February 26, 1999

Table 1

Date	Entity (State)	Depletion	Duration	Annual Accounting of 3,000 a-f Minor Depletions													
				1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	
3/5/92	City of Bloomfield (NM) (Renewed for 5 years on 7/1/98)	40 a-f	5 years	40	40	40	40	40	40	40	40	40	40	40	40	40	-
3/5/92	Elks Lodge No. 1747 (NM) (Renewed for 5 years on 7/1/98)	20 a-f	5 years	20	20	20	20	20	20	20	20	20	20	20	20	20	-
3/5/92	Mr. Douglas Lee (NM) (Renewed for 5 years on 7/1/98)	80 a-f	5 years	80	80	80	80	80	80	80	80	80	80	80	80	80	-
3/5/92	Nielson Incorporated (NM)	14 a-f	1 year	14	0	0	0	0	0	0	0	0	0	0	0	0	-
3/5/92	Bloomfield Refinery (see San Juan Refining Co. 8/14/95) (NM)	340 a-f	1 year	340	0	0	0	0	0	0	0	0	0	0	0	0	-
3/5/92	San Juan Basin Water Haulers (Renewed for 5 years on 7/1/98 for 200 a-f) (NM)	500 a-f	5 years	500	500	500	500	500	200	200	200	200	200	200	200	200	-
6/26/92	Forest Groves Estates Homeowners Association (CO)	43 a-f ¹	5 years	See Contract Sales March 4, 1998													
6/26/92	Los Ranchitos, Inc. (CO)	36 a-f ¹	5 years	See Contract Sales March 4, 1998													
6/26/92	Country Aire Estates (CO)	7 a-f ¹	5 years	See Contract Sales March 4, 1998													
5/18/93	Burns Fish Pond (CO)	1 a-f		0	1	1	1	1	1	1	1	1	1	1	1	1	-
6/17/93	Pagosa Springs (CO)	4 a-f		0	4	4	4	4	4	4	4	4	4	4	4	4	-
8/30/93	Elk Springs Ranch (CO)	3 a-f		0	3	3	3	3	3	3	3	3	3	3	3	3	-
1/6/94	Pond Construction (CO)	5.1 a-f		0	0	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	5.1	-
5/1/94	E. Earl Hickman (Renewed for 5 years on 7/1/98) (NM)	150 a-f	1 year/ 5 years	0	0	150	0	150	150	150	150	150	150	150	150	150	-

¹Not included as a minor depletion because it was included in the 18,000 a-f baseline depletion for Colorado - Region 6 (FWS) did not issue a biological opinion for these depletions.

Table 1

Date	Entity (State)	Depletion	Duration	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
9/15/98	CoE Infiltration Gallery-Pagosa (CO)	404 a-f		0	0	0	0	0	0	404	404	404	404	404	404	404
9/31/98	USFS 2 Projects (CO)	19 a-f		0	0	0	0	0	0	19	19	19	19	19	19	19
Cumulative Annual Total (a-f).....				994	648	980.6	1644.84	2124.87	1396.55	3104.43	2928.43	-	-	-	-	-
Balance Available (a-f).....				2006	2352	2019.4	1355.16	875.13	1603.45	-104.43	71.57	-	-	-	-	-

Table 2. San Juan River Environmental Baseline Depletion.

Depletion Category	Average Depletions KAF/YR	Average Totals KAF/YR
New Mexico Depletions		
San Juan-Chama ¹	107.5	
Navajo Indian Irrigation Project - Blocks 1-8 ²	149.4	
Navajo Reservoir Evaporation ³	28.3	
Hammond Canal	10.2	
Utah International	39.0	
Existing Private and Tribal Rights with the following breakdown:	113.8	
Upstream of Navajo Dam - private	0.8	
Upstream of Navajo Dam - Jicarilla Apache Tribe	2.2	
San Juan between Archuleta and Farmington (Citizen's & Misc.)	9.1	
Bloomfield industrial diversion	2.5	
Animas River irrigation not including Farmer's Mutual	36.7	
Farmer's Mutual Ditch	9.6	
LaPlata River	9.6	
Fruitland (Navajo)	7.9	
Jewitt Valley	3.1	
Municipal and industrial uses	9.0	
Hogback and Cudei projects (Navajo) ⁴	13.0	
Westwater Canyon	0.1	
Scattered Rural Domestic Uses ⁵	1.4	
Scattered Stockponds & Livestock Uses ⁵	2.2	
Fish and Wildlife uses ⁵	1.4	
Chaco River ⁵	4.6	
Whiskey Creek ⁵	0.6	
M&I Contracts from Navajo Dam - San Juan Power Plant	16.2	
Minor Depletions (NM portion of 3,000 af approved by SJRIP 1992)	1.5	
Total New Mexico Depletions - Excluding ALP		465.9
Colorado Depletions		
Upstream of Navajo Dam including the following ⁶ :	97.0	
Upper San Juan	10.9	
Navajo-Blanco	7.9	
Piedra	8.5	
Pine River	69.7	
Downstream of Navajo Dam including the following ⁶ :	88.1	
Florida	28.6	
Animas and La Plata Rivers	39.6	
Mancos	19.9	
Total Colorado Depletions - Excluding ALP		185.1
Animas LaPlata Project (Colorado and New Mexico)		57.1
Utah Depletions⁶		10.9
Arizona Depletions⁵		12.4
Total San Juan River Basin Depletions		731.4
Return Flow from Dolores River Imports		-15.2
Net Depletions Measured at Bluff, Utah		716.2

¹ 1989 San Juan Chama Project Yield Analysis reports 109,532 af/yr average for 1935-1987. Numbers shown are for 1929 - 1993.

² Includes 16,420 af/yr transferred from Hogback and Hogback extension.

³ Increased by 2,300 af/yr due to re-operation of Navajo Dam for fish releases.

⁴ 16,420 af/yr transferred to NIIP, including 10,000 af from Hogback extension.

⁵ Offstream depletion accounted for in calculated natural gains to the river.

⁶ 1,705 af/yr San Juan River Depletion, 9,224 af/yr off-stream depletion accounted for in calculated natural gains.

Table 3. Rangewide population status for the southwestern willow flycatcher (based on composite of 1993-1995 survey data and 1996 survey data from lower Colorado River)¹.

	No. of Sites with Territories	No of Drainages with Territories	No. of Sites (Drainages)			No. of Territories
			with ≤5 Territories	with 6-20 Territories	with >20 Territories	
New Mexico	19	8	16 (6)	2 (1)	1 (1)	173
Arizona	39	9	29 (4)	10 (4)	0 (2)	150
California	18	11	13 (8)	3 (1)	2 (3)	114
Colorado	6	5	6 (5)	0 (0)	0 (0)	13
Utah	2	1	2 (1)	0 (0)	0 (0)	2
Nevada	1	1	1 (1)	0 (0)	0 (0)	2
Texas	?	?	?	?	?	?
Total	85	35	67 (24)	15 (4)	3 (7)	454

Based on surveys conducted at >800 historic and new sites in NM (Maynard 1995, Cooper 1996, Skaggs 1996); AZ (Sogge and Tibbitts 1992, Sogge *et al.* 1993; Muiznieks *et al.* 1994; Sogge and Tibbitts 1994; Sferra *et al.* 1995; Sogge 1995a; Sogge *et al.* 1995; Spencer *et al.* 1996, 1997; McKernan *in litt.*); CA (Camp Pendleton 1994; Whitfield 1994; Griffith and Griffith 1995, Holmgren and Collins 1995; Kus 1995; Whitfield and Strong 1995; Griffith and Griffith 1996 *in litt.*); CO (T. Ireland 1994 *in litt.*, Stransky 1995); UT (McDonald *et al.* 1995; Sogge 1995b); NV (C. Tomlinson 1995 *in litt.*). Systematic surveys have not been conducted in Texas. For sites surveyed multiple years, highest single-year estimate of territories was used to tabulate status data. Tabulations do not include documented extirpations within survey period. Thus, individual state estimates and rangewide totals may be biased upward.

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APPENDIX

ADDRESS

In accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), and the Interagency Cooperation Regulations (50 CFR 402), the Fish and Wildlife Service (Service) reviewed your _____ correspondence regarding the impacts of the _____ on endangered Colorado River fish. The proposed action will cause a average annual depletion of ___ acre-feet.

A Recovery Implementation Program for Endangered Fish Species in the San Juan River Basin (Recovery Program) was initiated in October 1992. The Recovery Program was intended to be the reasonable and prudent alternative to avoid jeopardy to the endangered fish by depletions from the San Juan River.

On _____ the Service issued a biological opinion determining that depletions of 100 acre-feet or less would not limit the provision of flows identified for the recovery of the Colorado pikeminnow and razorback sucker and, thus, not be likely to jeopardize the endangered fish species or result in the destruction or adverse modification of their critical habitat.

The _____ should condition their _____ permit to retain jurisdiction in the event that the Recovery Program is unable to implement the flows identified for recovery in a timely manner. In that case, as long as the lead Federal Agency has discretionary authority over the project, reinitiation of section 7 consultation may be required.