



United States Department of the Interior

FISH AND WILDLIFE SERVICE

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In Reply Refer To:
R2/ES-SE

NOV 3 1997

2-21-97-F-143

Memorandum

To: Refuge Manager, San Bernardino National Wildlife Refuge, Douglas, Arizona

From: Geographic Manager, Arizona *John Ciccio*

Subject: Biological Opinion for the San Bernardino National Wildlife Refuge Yaqui Catfish and Yaqui Sucker Reintroduction

The U.S. Fish and Wildlife Service has reviewed the Intra-Service section 7 consultation on the Yaqui catfish (*Ictalurus pricei*) and Yaqui sucker (*Catostomus berrardini*) reintroduction on the San Bernardino National Wildlife Refuge (SBNWR), Cochise County, Arizona. Your request was received on June 6, 1997. This document represents the Service's biological opinion on the effects of that action on the following listed species: the endangered Yaqui topminnow (*Poeciliopsis occidentalis sonoriensis*), endangered Yaqui chub (*Gila purpurea*) with critical habitat, threatened beautiful shiner (*Cyprinella formosa*) with critical habitat, and the threatened Yaqui catfish with critical habitat under Section 7 of the Endangered Species Act of 1973 (Act), as amended, (16 U.S.C. 1531 et seq.).

Intra-Service activities will consider effects on listed, proposed, and candidate species [USFWS Manual 733 FW 3.2(b)]. Candidates are treated as if they are proposed for listing. The only candidate species considered in this consultation is the Chiricahua leopard frog (*Rana chiricahuensis*).

This biological opinion is based on: (1) Information provided in the June 4, 1997, Intra-Service section 7 Biological Evaluation (BE); (2) telephone conversations; (3) field investigations; (4) data in our files; and (5) other sources of information. A complete administrative record of this consultation is on file in the Tucson suboffice.

After reviewing: (1) The status of the Yaqui chub, the beautiful shiner, the Yaqui topminnow, the Yaqui catfish, and the Chiricahua leopard frog; (2) the environmental baseline for the action area; (3) the effects of the proposed action; and (4) the cumulative effects, it is the Service's Biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of any of these species. Critical habitat has been designated for the Yaqui chub, beautiful shiner, and Yaqui catfish. However, the proposed action causes no net change for critical habitat, and there will be no destruction or adverse modification of critical habitat.

BIOLOGICAL OPINION

Description of the Proposed Action

The purpose of the proposed action is to reestablish local populations of the threatened Yaqui catfish and unlisted Yaqui sucker. This proposed action follows the objectives contained in the Yaqui Fishes Recovery Plan (USFWS 1995) and USFWS directives for enhancing biodiversity in an ecosystems approach to biological conservation.

The Yaqui catfish and Yaqui sucker are currently extirpated from the United States. Modification and loss of their natural habitats, and hybridization with introduced catfishes are causing Mexico's wild populations of these fish to deteriorate rapidly. Reintroduction of Yaqui catfish into its critical habitat would advance recovery efforts for the species. The establishment of refugia and genetically pure stocks for future reintroductions to historic habitats in the United States and Mexico would then be possible. Reintroduction of Yaqui sucker may lead to re-establishment of this native fish into the United States.

The proposed action will involve stocking Yaqui catfish and Yaqui sucker in aquatic habitats within an Area of Ecological Concern (USFWS 1995) in addition to designated critical habitat (USFWS 1984). Specific locations include: (1) Twin and Oasis Ponds on San Bernardino Refuge; and (2) House Pond at Slaughter Ranch (Johnson Historical Museum). Possible reintroductions may occur also at: (1) Douglas Golf Course ponds; (2) Douglas High School Outdoor Classroom pond; (3) Kovac's Lake in Whitewater Draw (Arizona Game and Fish Department); (4) Rucker Lake; (5) other waters in San Bernardino and Sulfur Springs Valleys; and (6) in Mexico.

The numbers of Yaqui catfish stocked in each pond will be dependent on depth and volume of water. However, numbers will not be less than the minimum needed, about 200, to maintain genetic variability – stocking-related mortalities included. Stocked fishes will primarily consist of "F₁" progeny from broodstock caught from the wild, averaging 8-10 inches in length. Both sexes will be stocked. Supplemental, or augmentation stocking may be done to maintain a viable population.

Twin Pond and House Pond will be stocked first. The size and depth of these ponds can support many catfish. Both ponds have allochthonous inputs from stream or spring-type inlets, resembling natural conditions. These two ponds also will provide information on community interactions with other Yaqui fishes that will assist future recovery decisions and actions. As additional catfish are provided, they may be stocked, foremost, to sites listed above according to the objectives of the Yaqui Fishes Recovery Plan.

Status of the Species

Yaqui Catfish (*Ictalurus pricei*)

The Yaqui catfish was listed as a threatened species on August 31, 1984. Critical habitat was designated for this species for "all aquatic habitat on the San Bernardino NWR" (USFWS 1984). However, this was before the addition of Leslie Creek to the SBNWR, and

Leslie Creek is not designated critical habitat. The factors contributing to the listing of the Yaqui catfish include habitat destruction or modification of habitat, predation, inadequacy of existing regulatory mechanisms, and other factors (USFWS 1984). The Yaqui catfish historically occurred in the headwaters of the Río Yaqui in southeast Arizona, but has since become extirpated in this area. Broodstock were obtained from the Río Aros, Sonora and the Río Sirupa, Chihuahua, Mexico in 1987 and 1990, and from Río de Bavispe, Sonora, Mexico in 1994 and 1995 under permit from the Mexican Government. These fish are currently under culture at Dexter National Fish Hatchery and Technology Center, New Mexico and Uvalde National Fish Hatchery (NFH), Texas.

The Yaqui catfish is a medium to large fish of the family Ictaluridae (Minckley 1973), with lengths of 40 cm, with weights of a kilogram or more common in wild specimens. A captive specimen at Dexter NFH weighs about 8 kg. These catfish live in deeper runs and riffles; in the canyon reaches of the Río Yaqui among roundtail chubs (*Gila robusta*) and Yaqui suckers, while beautiful shiners and Mexican stonerollers (*Campostoma ornatum*) occupy shallower waters along its banks. Yaqui catfish will frequent riffles and runs at night during feeding activity. Their diet includes aquatic invertebrates, other fishes, and organic debris. Adults spawn in depressions or holes in the bank, and males will defend the nest and young for a time. The juveniles eventually move to riffles where they occupy shallow water between heavier substrates (Rinne and Minckley 1991).

The first collection of Yaqui catfish was made in San Bernardino Creek, at the U.S. and Mexico border. Historically, Yaqui catfish were found in the Yaqui (Hendrickson *et al.* 1980, Campoy-Favela *et al.* 1989), Sonora (Miller 1940), Casa Grandes (Smith and Miller 1986, Propst and Stefferud 1994), and Fuerte River systems (Miller 1976, 1978). *Ictalurus pricei* is apparently extirpated from the Río Casa Grandes (Smith and Miller 1986, Propst and Stefferud 1994).

In the Río Yaqui basin, the Yaqui catfish has been found in medium to large creeks and rivers with medium to slow current over sand or rock substrates (Hendrickson *et al.* 1980). They also found it in small streams in clear pools over sand gravel substrates. There is little information on the life history of this species. Minckley (1985) suggested that the ecology of the Yaqui catfish and channel catfish (*Ictalurus punctatus*) are similar. The exotic channel catfish has hybridized with Yaqui catfish in some areas of the Río Yaqui basin.

Yaqui Topminnow (*Poeciliopsis occidentalis*)

The Sonoran topminnow was listed as endangered on March 11, 1967. The Yaqui form was originally described as a full species (Girard 1859). The Gila and Yaqui forms were recognized as subspecies of *Poeciliopsis occidentalis* by Minckley (1969). Critical habitat has not been designated for the Sonoran topminnow. This species is a small, livebearing fish of the family Poeciliidae (Minckley 1973) that is found throughout the Río Yaqui and adjacent drainages in Arizona and Sonora, Mexico. However, it is listed only in the United States' portion of its range (Hendrickson *et al.* 1980, Juarez-Romero *et al.* 1988, Campoy-Favela *et al.* 1989). Historic range of this species in the United States encompassed the lower to mid- elevation reaches of the Río Yaqui basin, including Whitewater and

Black Draws. Much of the habitat in those areas now has been lost to water diversion, stream downcutting, backwater draining, vegetation clearing, channelization, grazing, groundwater pumping, and other human uses of the natural resources (USFWS 1984). In addition, nonnative fish have been introduced in many portions of historic range in the United States. The mosquitofish (*Gambusia affinis*), a particularly damaging species, was first found in the United States portion of the Río Yaqui basin in 1979 (Hendrickson *et al.* 1980, Meffe *et al.* 1983, Galat and Robertson 1992).

In the United States, Yaqui topminnow are presently found only on the SBNWR and Leslie Canyon NWR. On the main Refuge they are found in Bathhouse Spring, Black Draw (San Bernardino Creek), Bunting Spring, Cottonwood Spring, Evil Twin Pond, Hay Hollow storage tank, House Pond, Mesquite Pond and an unnamed pond at its outflow, Middle Spring, Oasis Pond, Robertson Ciénega, Twin Pond, Two PhD Ponds, and Tule Spring (SBNWR memorandum May 26, 1994). Many of these stocked populations are in enhanced or artificially created habitats which are part of the recovery program. The population in Leslie Creek was stocked in 1969 with individuals taken from Astin Spring in the Black Draw drainage (Minckley and Brooks 1985). The populations are generally small, fluctuate greatly, and are in a relatively small geographic area susceptible to cataclysmic events.

Yaqui Topminnow habitat preferences include warm springs, ciénegas, ponds, pools, and stream margins where water current is slight. Individuals are most commonly observed in the upper portion of the water column (<80 cm, Maes 1995), especially at the surface and adjacent to submerged vegetation. The species' diet consists of aquatic insect larvae (including mosquitoes), amphipod crustaceans, detritus, and living vegetative material (Minckley 1973, Gerking and Plantz 1980).

Females are larger than males, usually 30-45 mm standard length. Breeding males are black, smaller than females (<25 mm standard length), and have an elongated anal fin (gonopodium) used to deliver a spermatophore to the female's urogenital opening. Reproduction occurs throughout the year where temperatures are fairly uniform. Females may have broods of 20-25 young at intervals of 20 days (Minckley 1973). Few wild individuals survive more than a year.

Yaqui Chub (*Gila purpurea*)

The Yaqui chub was listed as an endangered species on August 31, 1984. Critical habitat was designated for this species for "all aquatic habitat on the San Bernardino NWR" (USFWS 1984). However, this was before the acquisition of Leslie Canyon, which is not part of the designated critical habitat. The Yaqui chub is a medium sized fish of the family Cyprinidae (Minckley 1973). Until recently, *Gila purpurea* was thought to occur in the basins of the Ríos Sonora, Matape, and Yaqui in Arizona and Sonora, Mexico (Hendrickson *et al.* 1980). In 1991, it was recognized that the chub in the Ríos Sonora and Matape and the Río Yaqui system downstream from San Bernardino Creek are a different species, *Gila eremica* (DeMarais 1991). *Gila purpurea* is endemic to San Bernardino Creek in Arizona and Mexico and possibly the Willcox Playa basin in Arizona (Varela-Romero *et al.* 1990, DeMarais 1991). It currently occurs in Bathhouse Spring, Black Draw, House Pond, Mesquite Pond, North Pond, Oasis Pond, Robertson Ciénega, Twin Pond, and Two PhD

Ponds on the SBNWR (SBNWR memorandum May 26, 1994). Only a few individual chubs were caught in Robertson Ciénega during the 1994 monitoring effort. Some of those populations have been stocked into enhanced or artificially created habitats as part of the recovery program. The population in Leslie Creek was stocked in 1969 with individuals taken from Astin Spring (Minckley and Brooks 1985). A population in Turkey Creek in the Chiricahua Mountains was stocked in 1986 and 1991 from Astin Spring (via Leslie Creek) stock raised at Dexter NFH.

Habitat preferences for Yaqui chub vary by life stage. Young fishes prefer marginal habitat and the lower ends of riffles. Adults prefer the deepest, most permanent pools, undercut banks adjacent to large boulders, debris piles, and roots of large riparian trees (Hendrickson *et al.* 1980). Diet consists mostly of algae, insects, and detrital material (Galat and Gerhardt 1987).

Breeding males are a bluish-grey color while females are straw-yellow to light brown color (Minckley 1973). Spawning is protracted throughout the warmer months, with greater activity in spring. Reproductive potential is high and large populations develop quickly from a few adults (DeMarais and Minckley 1993). Growth to maturity is rapid, often within the first summer of life.

Beautiful Shiner (*Cyprinella formosa*)

The beautiful shiner was listed as a threatened species on August 31, 1984. Critical habitat was designated for this species for "all aquatic habitat on the San Bernardino NWR" (USFWS 1984). However, this was before the acquisition of Leslie Canyon NWR, and Leslie Canyon is not part of the designated critical habitat. The beautiful shiner is a small fish of the family Cyprinidae (Minckley 1973). It occurred in the Río Yaqui in Arizona and in Sonora and Chihuahua, Mexico, and in the Mimbres River and Guzman basin in New Mexico and Chihuahua, Mexico. It has since been extirpated from the Mimbres River (Hendrickson *et al.* 1980, Campoy-Favela *et al.* 1989, Sublette *et al.* 1990). Water diversion, stream downcutting, backwater draining, vegetation clearing, channelization, grazing, groundwater pumping, and other human uses of the natural resources resulted in the extirpation of the beautiful shiner from the United States. In 1990, beautiful shiner was reintroduced into the SBNWR from collections made in 1989 from Río Moctezuma, Chihuahua, Mexico. Populations now exist in Evil Twin Pond, Oasis Pond, Mesquite Pond, Little Mesquite Pond, and Twin Pond (SBNWR memorandum dated May 26, 1994).

Habitat preference for beautiful shiner in the Río Yaqui drainage are riffles of running streams and creeks. Where flow is intermittent, pools suffice as habitat until riffles become available in the next wet season (Hendrickson *et al.* 1980). Beautiful shiners on the San Bernardino NWR prefer the subsurface zone of the water column (41- 80 cm) and do not appear dependent on proximity to vegetative cover (Maes 1995).

Breeding colors of male beautiful shiners are a darkened dorsal fin and yellow-orange to orange coloration on remaining fins (Minckley 1973). Numbers of young-of-year fishes in ponds on San Bernardino NWR, indicate recruitment in beautiful shiners may approach that of the red shiner (*Cyprinella lutrensis*). However, relatively few individuals live to

reproductive size class (SBNWR files). Stream population trends are likely to differ from pond populations. Little else is known about the beautiful shiner.

Status of the Species (Range-wide)

Southeastern Arizona has been influenced by Europeans for hundreds of years and by native Americans for a longer time (Bahre 1991). Europeans have influenced the San Bernardino Valley since the late 17th century (Wagoner 1975). Trees and small shrubs such as mesquite (*Prosopis juliflora*), whitethorn acacia (*Acacia vernicosa*), and burroweed (*Haplopappus tenuisecta*) have probably increased at the expense of desert grassland. The abandoned agricultural fields found on the San Bernardino NWR were converted at the expense of native vegetation. Most early accounts comment on the luxuriant grass present in the vicinity of the ranch (see Lanning 1981 and Davis 1982). Some investigators of the subject believe that native grasslands were maintained by fire (Hastings 1959, Wright 1980, Bock and Bock 1990). These regional vegetation changes can be seen at San Bernardino NWR.

The riparian and wetland areas of the Refuge have declined from what they were historically (Hastings and Turner 1965, Lanning 1981) and are part of a region-wide decline (Lowe 1964, Carothers *et al.* 1974). Early accounts show that San Bernardino Creek/Black Draw had, at most, a small channel (see Lanning 1981 and Davis 1982), as opposed to the large incised cut present today.

Status of the Species in the Action Area

The San Bernardino National Wildlife Refuge was established in the 1980's for the conservation and recovery of fishes indigenous to the Rio Yaqui Basin. Four Yaqui fish species are federally-listed as either threatened or endangered. Critical habitat has been designated on the San Bernardino NWR for two cyprinid fishes, the endangered Yaqui chub and the threatened beautiful shiner, and one ictalurid, the threatened Yaqui catfish. Table 1 displays the locations of listed species on SBNWR.

Table 1. Locations of listed fish on the San Bernardino National Wildlife Refuge.			
Water body	Yaqui topminnow	Yaqui chub	beautiful shiner
North	+++	+++	
Bathhouse	+++		
Black Draw	+++	+++	
Cottonwood	+++		
Hay Hollow Storage Tank	+++		
House Pond	+++	+++	

Table 1.(Cont'd) Locations of listed fish on the San Bernardino National Wildlife Refuge.			
Water body	Yaqui topminnow	Yaqui chub	beautiful shiner
Tule	+++		
Little Mesquite	+++	+++	+++
Bunting	+++		
Mesquite	+++	+++	+++
Oasis	+++	+++	+++
Twin	+++	+++	+++
Evil Twin	+++	+++	+++
Robertson	+++		

All the ponds are designated critical habitat as all aquatic habitat on the Refuge is designated as critical habitat. The known constituent elements for the Rio Yaqui fishes include clean, small permanent streams and spring pools without exotic fishes and backwater areas of springs with overgrown cutbanks and accumulations of detritus are necessary for feeding and shelter (USFWS 1984). The status of each of the fish in the action area is included in the preceding section regarding the status of the species.

Effects of the Action

The proposed action will affect other listed fishes and their habitats in several ways. The role of catfish will undoubtedly result in incidental take of other listed fishes (Rinne and Minckley 1991, USFWS 1995). However, reintroducing selection pressures that were part of evolutionary history of Yaqui fish communities may prove beneficial to those affected species. Catfish may select particular species if habitat segregation (Maes 1995) influences niche-specific foraging, and thereby alters current community composition. Yaqui catfish are not obligate piscivores, and other faunal dietary components are likely to consist of aquatic invertebrates and small vertebrates. Catfish also may select certain life history stages of bullfrogs (*Rana catesbiana*), possibly reducing bullfrog population densities.

Male and female catfish will be released. However, even under the controlled conditions at Dexter and Uvalde, successful breeding is rare. Also, male Yaqui catfish are very antagonistic towards the females. Released catfish may not be self-sustaining and may only be maintained with supplemental stocking.

In aquaculture, catfish are known to increase turbidity in ponds by stirring sediments. Turbidity reduces light penetration preventing growth of submergent vegetation. It is not anticipated that Yaqui catfish will reach densities maintained in aquaculture, therefore significant increases in turbidity are not expected and critical habitat is not likely to be affected.

Selective stocking of Yaqui catfish will provide additional information on community interactions that will influence future management decisions and actions.

The Yaqui sucker is not expected to have measurable effects on listed species. They may cause minor changes to habitat. Yaqui suckers may also ingest fish eggs or fry, but the potential is discountable and insignificant.

Cumulative Effects

Cumulative effects are those effects of future non-federal (state, local government, or private) activities on endangered or threatened species or critical habitat that are reasonably certain to occur during the Federal activity subject to consultation. Future Federal actions are subject to the consultation requirements established in section 7 and, therefore, are not considered cumulative in the proposed action.

The cumulative effects that may impact listed species on the SBNWR are difficult to assess. Effects that are reasonably certain to occur are associated with the expected population growth of the Douglas, Arizona and Agua Prieta, Sonora region. Associated effects may include pollution, increased visitation to the refuge, and increased resource use and degradation. Decreases in the flows of the artesian wells on SBNWR have already been documented in response to groundwater pumping in Mexico (USFWS 1995). The passage of the North American Free Trade Agreement could result in additional impetus for growth in the region.

Conclusion

After reviewing the status of the Yaqui topminnow, Yaqui chub, beautiful shiner, Yaqui catfish, and Chiricahua leopard frog, 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 action is not likely to jeopardize the continued existence of these species, and is not likely to destroy or adversely modify designated critical habitat.

Incidental Take

Sections 4(d) and 9 of the Act, as amended, prohibit taking (harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct) of listed species of fish or wildlife 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. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. Incidental take is any take of listed animal species that results from, but is not the purpose of, carrying out an otherwise lawful activity conducted by the Federal agency or the applicant. 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 a prohibited taking provided that such taking is in compliance with the terms and conditions of this incidental take statement.

Sections 7(b)(4) and 7(o)(2) of the Act do not apply to the incidental take of listed plant species. However, protection of listed plants is provided where the Act requires a Federal permit for removal or reduction to possession of endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any regulation of any State or during any violation of a State criminal trespass law.

The measures described below are non-discretionary, and must be implemented by the agency so they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The Service has a continuing duty to regulate the activity covered by this incidental take statement.

Amount or Extent of Take

The Service anticipates incidental take of Yaqui catfish, Yaqui chub, Yaqui topminnow, and beautiful shiner will be difficult to detect for the following reasons: dead specimens will be difficult to enumerate without sacrificing (taking) Yaqui catfish for stomach analyses. Also, take of these species can be anticipated through competition with Yaqui catfish for similar forage or prey. Most fish in each pond will undergo some form of take, either through death or harassment.

Anticipated take will be considered to be exceeded if populations of Yaqui chub, Yaqui topminnow, and beautiful shiner fall below levels needed to maintain population viability (200 individuals). Because the stocking of Yaqui catfish is an experiment (not experimental non-essential under § 10j of the Act) and may not develop self-sustaining populations, all stocked Yaqui catfish may eventually be lost.

If, during the proposed action, the amount or extent of the incidental take anticipated is exceeded, the SBNWR must reinstate consultation with the Service immediately to avoid violation of section 9. Operations must be stopped in the interim period between the initiation and completion of the new consultation if it is determined that the impact of the additional taking will cause an irreversible and adverse impact on the species, as required by 50 CFR 402.14(i). An explanation of the causes of the taking should be provided to the Service.

Reasonable and Prudent Measures

The Service believes the following reasonable and prudent measures are necessary and appropriate to minimize the take of the above four species.

1. Conduct the proposed action in a manner which will minimize mortality of Yaqui catfish, Yaqui topminnow, beautiful shiner, and Yaqui chub.
2. Conduct the proposed action in a manner which will minimize destruction or modification of habitat for Yaqui catfish, Yaqui topminnow, Yaqui chub, and beautiful shiner.

3. Maintain complete and accurate records of listed fish species populations and status and water quality of constructed habitats.

Terms and Conditions for Implementation of Reasonable and Prudent Measures

To be exempt from the prohibitions of Section 9 of the Act, SBNWR is responsible for compliance with the following terms and conditions, which implement the reasonable and prudent measures described above. These terms and conditions are nondiscretionary.

1. The SBNWR shall implement the proposed action as written with the following terms and conditions as additions or exceptions.
2. The SBNWR shall monitor fish populations and habitat conditions before and after project implementation.
 - a. Not more than 3 months before catfish are released, the SBNWR shall determine the population abundance of all fishes in the waters to be stocked.
 - b. After Yaqui catfish are released, the SBNWR shall monitor the population abundance of all four listed fish species every 3 months, beginning 1 month after catfish release.
 - c. The SBNWR shall make weekly inspections of the waters where catfish are released to check for potential problems (*e.g.* exceeding anticipated take) for 2 months immediately after catfish release.
 - d. Fourteen months after the catfish release, the SBNWR may resume its normal monitoring schedule, if no problems are identified.
3. Oasis Pond may not be stocked with Yaqui catfish until it is demonstrated that beautiful shiner can maintain their population in the presence of Yaqui catfish. Approval of the Arizona Ecological Services Office (AZESFO) must be obtained before release of Yaqui catfish.
4. The SBNWR shall monitor aquatic habitat at the release sites every month for changes. If a problem is identified, the AZESFO will be notified within 5 working days.
5. Report all results of the habitat and population monitoring 1 year after the initial catfish release.

Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information.

1. The SBNWR should consult on the Comprehensive Management Plan, and consider including all planned, site specific actions. This would reduce the number of consultations needed.

In order for the Service to be kept informed of actions minimizing or avoiding adverse effects or benefitting listed species or their habitats, the Service requests notification of the implementation of the conservation recommendation.

Reinitiation - Closing Statement

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 incidental take is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the action is later 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 of consultation.

This concludes formal consultation on the actions outlined in the June 4, 1997, request for formal consultation on the SBNWR, Cochise County, Arizona. Questions regarding this biological opinion should be directed to Angie Brooks at (602) 640-2720, or Doug Duncan (520) 670-4860, at the AZESFO and the Tucson suboffice, respectively.

cc: Director, Fish and Wildlife Service, Washington, D.C. (HC)
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Supervisor, Ecological Services Field Office, Phoenix, AZ

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