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Email Transmission
Memorandum

To: Regional Director, Fish and Wildlife Service, Albuquerque, New Mexico
(Attn: Luella Roberts) (ES-TE)

From: Field Supervisor

Subject: Biological Opinion on Issuance of a 10(a)(1)(A) Enhancement of Survival Permit to James W. Crosswhite on 394 Acres of the EC Bar Ranch for Two Federally Listed Species in Arizona

This document transmits the U. S. Fish and Wildlife Service's (FWS) biological opinion for the application from James W. Crosswhite on 60 acres of the EC Bar Ranch for an Endangered Species Act (Act) section 10(a)(1)(A) Safe Harbor Enhancement of Survival Permit (TE-075891-0). The proposed permit would cover habitat restoration activities on private land for the following species: the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) and the threatened Little Colorado spinedace (*Lepidomeda vittata*).

The primary objective of the Safe Harbor Agreement (SHA) is to encourage voluntary habitat restoration or enhancement activities to benefit the above listed species. This SHA follows the FWS's June 17, 1999, final Safe Harbor Policy (64 FR 32717) and final regulations (64 FR 32705). This final policy encourages property owners to voluntarily conserve threatened and endangered species without the risk of further restrictions pursuant to section 9 of the Act. In order to provide the necessary assurances to participating property owners, while providing conservation benefits to the covered species, accompanying permits to SHAs are issued under section 10(a)(1)(A) of the Act (i.e., enhancement of survival).

This biological opinion addresses the effects of implementation of a Safe Harbor program for conservation of the southwestern willow flycatcher and Little Colorado spinedace on 60 acres of the EC Bar Ranch in Arizona. This biological opinion is based on information provided in the intra-Service Section 7 consultation for the EC Bar Ranch project; telephone discussions and email responses with Mr. Crosswhite conducted from September 2002 to August 2003; the Private Lands Agreement (FWS Agreement No. 1448-20181-2-G598) dated July 28, 2002; Mr. Crosswhite's internet web site (www.ecbarranch.com); and other sources of information in the Fish and Wildlife Service files. An administrative record of this consultation is on file at the Arizona Ecological Services Field Office (AESO).

Consultation History

- September 2002 - July 2003: Worked with James W. Crosswhite (Cooperator) to develop draft Safe Harbor Agreement.
- July 31, 2003: Cooperator submitted an application for an Enhancement of Survival Permit under section 10(a)(1)(A) of the Act. September 12, 2003: *Federal Register Notice* was published announcing the permit application and the draft Safe Harbor Agreement available for public comment.
- October 14, 2003: 30-day public comment period closed. FWS received three written comments on the application during the public comment period. These comments have been addressed.

BIOLOGICAL OPINION

I. DESCRIPTION OF PROPOSED ACTION

The proposed action is the issuance of a 50-year Enhancement of Survival Permit to the Cooperator that will make possible implementation of a Safe Harbor program for conservation of the southwestern willow flycatcher and Little Colorado spinedace on approximately 60 acres (referred to as Enrolled Lands in the SHA) of the 394-acre EC Bar Ranch in Apache county, Arizona. The term of the SHA is 50 years and addresses proposed management activities affecting lands owned by the Cooperator. The management activities will be funded through the U.S. Fish and Wildlife Service's Partners for Fish and Wildlife Program and the Water Quality Improvement Grant Program from the Arizona Department of Environmental Quality (ADEQ). Under the Partners Program, a Private Lands Agreement (PLA) has been signed with the Cooperator and will be in effect for 10 years, beginning on July 28, 2002.

The objective of the SHA is to enhance and improve riparian habitat and stream conditions on a 60-acre portion of the EC Bar Ranch property. The EC Bar Ranch is located in the Nutrioso Creek drainage, approximately 15 miles south of Eagar/Springerville in Apache County, Arizona in sections 20 and 29 of township 7 north, range 30 east of the Gila and Salt River Base Line Meridian. The proposed project occurs entirely on private land owned by the Cooperator. The SHA encourages proactive conservation efforts by the Cooperator while providing him certainty that future property-use restrictions will not be imposed above those required to maintain current species baseline if those efforts attract southwestern willow flycatchers and Little Colorado spinedace to his Enrolled Lands. The Cooperator plans to undertake several management activities on the EC Bar Ranch. These activities include, but are not limited to, riparian vegetation restoration activities, harvesting of riparian vegetation, planting of grasses and shrubs along the flood plain terrace, and repairing old and installing new livestock and elk fence enclosures. These activities are described in detail below.

Restoration of Riparian Vegetation

Within the 60 acres of the Enrolled Lands, the Cooperator plans to plant between 10,000 and 21,000 riparian trees and shrubs as well as sedges and grasses native to Arizona along 2.5 miles

of Nutrioso Creek. Riparian vegetation to be planted include coyote willow (*Salix exigua*), strap-leaf willow (*S. ligulifolia*), shiny willow (*S. lucida*), narrowleaf cottonwood (*Populus angustifolia*), thin-leaved alder (*Alnus tenuifolia*), and other native riparian species that are available.

Funding from ADEQ has been used by the Cooperator to develop a riparian restoration plan. The *EC Bar Ranch Riparian Restoration Implementation Plan for Nutrioso Creek* (Zeedyk 2002) assesses planting locations and techniques for revegetating this portion of the stream. The stream has been divided into six stream reaches (reaches 1, 2, 2A, 3, 4, and 6). The Cooperator does not own reach 5. These reaches are identified in figure 1. Revegetation activities are planned to start January 2004 and continue until April 2004 based on weather and instream conditions. This is the dormant season for species such as willows and cottonwoods.

The riparian vegetation will be planted by inserting cuttings of branches (called whips or poles) that are at least 6 feet in length into holes created by an electric hammer drill into the floodplain sediment. Holes will be drilled to a depth where the water table is intercepted. The pole cuttings require saturated soil conditions in order to establish.

Two techniques for planting the pole cuttings will be used. One technique will be to create standing bundles. This technique will utilize an electric hammer drill to drill several 3-foot x 1-inch holes in the floodplain sediment. A willow pole that has been cut at angle on one end is pushed into the hole. Another pole is planted close to the first hole using the same method until about 10 poles or more are placed close together within a 12-inch diameter circle. This is one standing bundle. The bundle does not need to be staked in place and is able to withstand high flow events. Generally 3 feet of the pole is below the ground. The second technique will be the planting of single poles.

Standing bundles will be placed 6 to 8 feet apart with two parallel rows of single poles planted in between on 12-inch centers. This will give a staggered two row appearance. If bank materials slough off, part of the soil is captured behind the standing bundles and single rows, thus reducing sediment into the channel.

The electric hammer drill will be powered from a generator mounted on a truck. The truck will be positioned outside the riparian fence on the upper terrace. A 100-foot electric cord connects the generator to the hammer drill. Location for the holes to be drilled will be marked with flagging. When a hole is drilled the hammer drill goes through rock or dry ground to reach the water table. If there is insufficient area on the floodplain for a person carrying the hammer drill to access, no planting will occur. Workers will be instructed to minimize impacts to the stream channel and water column by keeping equipment out of the channel and by avoiding physical entry into the channel. Moving equipment from one side of the stream channel to the other will be accomplished by accessing the bridge the Cooperator has installed. The likelihood of sediment getting into the stream as a result of this action is minimal.

Although the Cooperator has no plans for removing the plantings in the future, he wishes to enter into a Safe Harbor Agreement in the event that an unforeseen need (e.g., a change in land use or a fire abatement action) necessitates the removal of some or all of the plantings.

Harvesting of Riparian Vegetation

In the Southwest, many riparian areas have been lost or degraded (Stromberg 1993, Arizona Riparian Council 1990, Szaro 1989). In Arizona, efforts by landowners as well as local, State, and Federal agencies are being made to restore these areas through revegetation projects. However, the sources for riparian plant materials, especially in high elevations, are limited. For this reason, the Cooperator plans to make cuttings of branches of the riparian vegetation along Nutrioso Creek available, once these trees become established, for other proposed revegetation projects.

The harvesting of cuttings from the riparian vegetation would occur in two to four years following planting. At that time, the planted trees should have grown to a size that would allow the harvesting of cuttings without compromising the objectives of the project (D. Dreesen, Agronomist NRCS Plant Materials Center, Los Lunas, New Mexico, pers. comm.). At the end of two years (after planting), FWS will meet with the Cooperator to determine if the riparian trees planted are of sufficient size and whether or not cuttings can be taken. Factors that will be used to make the determination include, but are not limited to, number of branches produced per tree, cutting length, branch diameter, and timing of harvest. Harvesting would occur when the vegetation is dormant; December through March.

The harvesting of cuttings must not impede the reasonable expectation of achieving a net conservation benefit to the affected species. It is anticipated that the net conservation benefit would provide an increase in the covered species' population and/or the enhancement, restoration, or maintenance of the covered species' habitat. It is reasonably expected that the net conservation benefit would be sufficient to directly or indirectly contribute to recovery of the covered species. When it is determined that the planted trees have reached sufficient size, FWS will work with the Cooperator so that harvesting of cuttings will be conducted in such a manner to maintain both the riparian habitat that has been established and the improved stream functions for native fish.

Exclosure Fencing and Buffer Strips for Erosion Control

The Cooperator also plans to improve the existing elk exclosure fencing along segments of Nutrioso Creek on the EC Bar Ranch. Additional steel pipe braces will be installed to maintain the existing plastic elk-proof fence. The fencing will improve control of ungulate foraging and promote riparian recovery and ecosystem health.

The floodplain terrace, the area between the exclosure fences and the stream bank, serves as a buffer strip. Buffer strips are areas or strips of land in permanent vegetation, designed to intercept pollutants and control other potential environmental damage. The buffer strip will be planted with native grasses, shrubs, and trees for the purpose of retaining sediment from eroding upland areas and preventing discharge into the creek as well as to improve existing habitat.

The objectives of the fence improvements and buffer strips are to reduce sediment load from upland sources and to manage livestock grazing in areas near stream banks. These measures should improve water quality as well as improve the physical stream condition.

Grazing Management

The Cooperator currently grazes livestock pursuant to a grazing management plan developed by the Natural Resource Conservation Service (NRCS) in 1997. The Cooperator has installed livestock and elk fencing in several areas of the EC Bar Ranch. Pastures have been created that exclude large ungulates from foraging in many segments of the riparian area. The Cooperator intends to install additional fencing of pastures for better livestock management and to improve conditions of these lands.

In the terms and conditions of the PLA, ungulates would be excluded from the project area for at least two growing seasons following project implementation to enhance vegetative recovery. At the end of two years, FWS will meet with the Cooperator to determine if the majority of riparian trees planted display good health and vigor (physical features to be considered include new stem growth, additional leaf foliage, new stems sprouting). If the trees are not in good health and vigor, these parties will meet annually to determine when grazing can resume during the growing season. If the trees display good growth and vigor, grazing during the growing season can resume. The Cooperator may graze livestock during the dormant season providing the grazing is consistent with the recommendations contained in the riparian restoration plan and the established grazing management plan, and does not reduce woody vegetation below the baseline level.

The following items are the proposed terms and conditions for the section 10(a)(1)(A) permit:

- A. The Cooperator, to the best of his ability, will ensure that the SHA is being implemented.
- B. The Cooperator assumes responsibility for securing any permits or other authorizations needed to carry out the project.
- C. The Cooperator is authorized to take southwestern willow flycatcher and Little Colorado spinedace to the extent that take of these species would otherwise be prohibited under section 9 of the Act. Such take must be incidental to activities associated with operations conducted during the SHA and the potential future return of the Enrolled Lands to the baseline condition described in the SHA. The permit will authorize the Cooperator to take all individuals of the species, and their progeny, that have increased in numbers and/or distribution on those lands, as a result of the Cooperator's voluntary conservation activities. Permit issuance will not preclude the need for the Cooperator to abide by all other applicable Federal, State, and local laws and regulations that may apply.
- D. At present, the baseline condition for the southwestern willow flycatcher on the EC Bar Ranch property is zero. As per the current Safe Harbor Policy, baseline can be described using measurements of available habitat. The baseline conditions for the Little Colorado spinedace have been described as the number of woody riparian trees (e.g., coyote willow, strap-leaf willow, narrowleaf cottonwood, and thin-leafed alder), that are three feet or taller, that are present either as individuals or as clumps along the 2.5 miles of Nutrioso Creek on the EC Bar Ranch at the signing of this SHA. Currently there are approximately 100 individual or clumps of woody riparian trees in the project area growing along the stream.

- E. The Cooperator reserves the right to return the land to baseline conditions at the end of the SHA or prior to, if the Cooperator decides to terminate the SHA. The Safe Harbor program allows for early termination of agreements. Therefore, the SHA can be terminated prior to the expiration date and the Cooperator can return the land to baseline conditions even if the expected “net conservation benefits” have not been realized. However, the purpose of this SHA is to restore and enhance habitat for these species. Thus, the Cooperator has stated that there are no activities planned that would return the property to baseline conditions. If the Cooperator wishes to return to baseline conditions, the Fish and Wildlife Service requests reasonable advance written notice (60 days minimum, if possible), for the opportunity to relocate affected, listed species.
- F. The Cooperator will notify the Fish and Wildlife Service 60 days in advance of any planned activity that the Cooperator reasonably anticipates will result in “take” (i.e., death, injury, or other harm) of the covered species on the Enrolled Lands, and provide FWS the opportunity to capture and/or relocate any potentially affected species, if appropriate.
- G. Monitoring of take, as well as monitoring of the effectiveness of the Safe Harbor program will be accomplished by the Arizona Game and Fish Department (AGFD), the Cooperator, and FWS. AGFD and FWS shall monitor wildlife habitat development and species in the project area of the EC Bar Ranch at least once every five years. The Cooperator agrees to allow FWS (its members, agents, or assigns) access to the EC Bar Ranch, upon prior reasonable notice. The Cooperator will submit an annual report to the Fish and Wildlife Service on the effects and effectiveness of the SHA and conservation actions by December 31 for the first four years of the SHA. After that time, monitoring reports will be submitted every three years for two reporting periods and then every ten years for the duration of the SHA.
- H. The monitoring report submitted by the Cooperator will include an inventory of riparian trees, photo point monitoring, observation records, a description of the number of cuttings harvested, and an evaluation of the condition of riparian fencing. Monitoring of the southwestern willow flycatcher would be initiated when the riparian habitat developed by this project establishes the structure which is thought to be required for this species and would be conducted by AGFD or FWS. Monitoring of Little Colorado spinedace will be conducted in cooperation with AGFD. AGFD plans to conduct monitoring of native fish on Nutrioso Creek in 2005.
- I. The Cooperator will report to the Fish and Wildlife Service any dead, injured, or ill specimens of southwestern willow flycatcher and/or Little Colorado spinedace observed on the Enrolled Lands within three working days of its finding. The Cooperator will contact the U.S. Fish and Wildlife Service, Law Enforcement Office, 2450 W. Broadway Rd. #113, Mesa, Arizona 85202 (480/967-7900) for care and disposition instructions.
- J. Conditions of this permit shall be binding on and for the benefit of the Cooperator and his respective successors and assigns. If the permit requires an administrative or minor amendment, FWS will process that amendment without the requirement of the Cooperator preparing any new documents or providing any mitigation over and above that required in the original permit.

Because Partners for Fish and Wildlife program is funding this proposed action, the Cooperator has signed an agreement to maintain the wildlife habitat developments for 10 years. The PLA for the Partners project is tied to the land. If the Cooperator decides to sell his property, the new landowner would take over the PLA and continue the maintenance of the wildlife habitat developments. The rights and responsibilities associated with the SHA would also be transferred to the new landowner if he or she were a non-Federal entity. As a result, formal agreements are in place to protect the riparian community through 2053.

II. STATUS OF THE SPECIES

Listed species/critical habitat

Southwestern Willow Flycatcher

The southwestern willow flycatcher is a small grayish-green passerine neotropical migrant bird (Family Tyrannidae) that breeds in the southwestern United States and migrates to Mexico, Central America, and possibly northern South America during the non-breeding season (Phillips 1948, Stiles and Skutch 1989, Peterson 1990, Ridgely and Tudor 1994, Howell and Webb 1995). The southwestern willow flycatcher is one of four currently recognized willow flycatcher subspecies (Phillips 1948, Unitt 1987, Browning 1993). The historical breeding range of the southwestern willow flycatcher included southern California, Arizona, New Mexico, western Texas, southwestern Colorado, southern Utah, extreme southern Nevada, and extreme northwestern Mexico (Sonora and Baja) (Unitt 1987).

The southwestern willow flycatcher was listed as endangered, without critical habitat on February 27, 1995 (U.S. Fish and Wildlife Service 1995). Critical habitat was later designated on July 22, 1997 (U.S. Fish and Wildlife Service 1997a). A correction notice was published in the Federal Register on August 20, 1997 to clarify the lateral extent of the designation (U.S. Fish and Wildlife Service 1997b). On May 11, 2001, the 10th circuit court of appeals set aside designated critical habitat in those states under the 10th circuit's jurisdiction (New Mexico). The Fish and Wildlife Service decided to set aside critical habitat designated for the southwestern willow flycatcher in all other states (California and Arizona) until it can re-assess the economic analysis. On May 2, 2002, this office sent out a scooping letter to over 800 interested parties requesting information in order to develop a critical habitat proposal.

A final recovery plan for the southwestern willow flycatcher was signed by the Fish and Wildlife Service's Region 2 Director on August 30, 2002, and was released to the public in March 2003. The Plan describes reasons for endangerment and the current status of the flycatcher, recovery actions, management needs, and recovery goals.

The flycatcher breeds in dense riparian habitats from sea level in California to just over 8,000 feet in Arizona and southwestern Colorado. Historical egg/nest collections and species' descriptions throughout its range document the flycatcher's widespread use of willow (*Salix* sp.) for nesting (Phillips 1948, Phillips *et al.* 1964, Hubbard 1987, Unitt 1987, Huels 1993). Currently, flycatchers primarily use coyote, Geyer's, and Goodding's willow, boxelder (*Acer negundo*), saltcedar (*Tamarix* sp.), Russian olive (*Elaeagnus angustifolia*) and live oak (*Quercus agrifolia*) for nesting. Other plant species less commonly used for nesting include buttonbush

(*Cephalanthus* sp.), black twinberry (*Lonicera involucrata*), cottonwood (*Populus* sp.), white alder (*Alnus rhombifolia*), blackberry (*Rubus ursinus*), and stinging nettle (*Urtica* sp.). Based on the diversity of plant species composition and complexity of habitat structure, four basic habitat types have been identified for the flycatcher: monotypic willow, monotypic exotic, native broadleaf dominated, and mixed native/exotic (Sogge *et al.* 1997).

Declining southwestern willow flycatcher numbers have been attributed to loss, modification, and fragmentation of riparian breeding habitat, loss of wintering habitat, and brood parasitism by the brown-headed cowbird (Sogge *et al.* 1997, McCarthy *et al.* 1998). Habitat loss and degradation are caused by a variety of factors, including urban, recreational, and agricultural development, water diversion and groundwater pumping, channelization, dams, and livestock grazing. Fire is an increasing threat to willow flycatcher habitat (Paxton *et al.* 1996), especially in monotypic saltcedar vegetation (DeLoach 1991) and where water diversions and/or groundwater pumping desiccates riparian vegetation (Sogge *et al.* 1997). Willow flycatcher nests are parasitized by brown-headed cowbirds (*Molothrus ater*) which lay their eggs in the host's nest. Feeding sites for cowbirds are enhanced by the presence of livestock and range improvements such as watering areas and corrals, agriculture, urban areas, golf courses, bird feeders, and trash areas. These feeding areas, when in close proximity to flycatcher breeding habitat, especially when coupled with habitat fragmentation, facilitate cowbird parasitism of flycatcher nests (Harris 1991, Tibbitts *et al.* 1994).

Unitt (1987) concluded that "...probably the steepest decline in the population level of *E. t. extimus* has occurred in Arizona...". Historical records for Arizona indicate the former range of the southwestern willow flycatcher included portions of all major river systems (Colorado, Salt, Verde, Gila, Santa Cruz, and San Pedro rivers) and major tributaries, such as the Little Colorado River and headwaters, and White River.

In 2002, 430 territories were known from 47 sites along 11 drainages in Arizona (Smith *et al.* 2003). Topock Marsh (elev. 459 feet) on the Lower Colorado River was the lowest elevation where nesting was detected and the highest elevation was at Duncan (elev. 3,650 feet) on the upper Gila River. Resident flycatchers were detected at two high-elevation sites: Alpine Horse Pasture (elev. 7,870 feet) and Greer River Reservoir (elev. 8,202 feet) (Smith *et al.* 2003).

As reported by Smith *et al.* (2003), the largest concentrations or general breeding locations of southwestern willow flycatchers in Arizona in 2002 were at the Salt River and Tonto Creek inflows to Roosevelt Lake (272 flycatchers, 146 territories); near the San Pedro/Gila river confluence (330 flycatchers, 172 territories); Gila River, Safford area (28 flycatchers, 19 territories); Alamo Lake on the Bill Williams River (includes lower Santa Maria and Big Sandy river sites) (26 flycatchers, 13 territories); Topock Marsh on the Lower Colorado River (30 flycatchers, 20 territories); Big Sandy River, Wikieup (21 flycatchers, 21 territories); and Alpine/Greer on the San Francisco River/Little Colorado River (3 flycatchers, 2 territories). The greatest numbers of flycatchers are found at two locations; Roosevelt Lake and the San Pedro/Gila confluence. These two locations make up 318 (74%) of the 430 territories known in the state.

While numbers have increased in Arizona, in a few specific areas distribution throughout the state has not changed much. Soon after listing, following the 1996 breeding season, 145 territories were known to exist in Arizona. In 2002, 430 territories were detected; a statewide

increase of 285 territories (Smith *et al.* 2003). Since listing, there has been an increase of 243 territories (75 to 318) at Roosevelt Lake and at San Pedro/Gila River confluence.

Recovery and survival of the flycatcher depends not only on numbers of birds, but territories/sites that are well distributed (Fish and Wildlife Service 2002). Currently, population stability in Arizona is believed to be largely dependent on the presence of two large populations at Roosevelt Lake and San Pedro/Gila River confluence. Therefore, the result of catastrophic events or losses of significant populations either in size or location could greatly change the status and survival of the bird.

This revegetation project is located within the Little Colorado Management Unit, which is within the Lower Colorado River Recovery Unit, as identified in the Southwestern Willow Flycatcher Recovery Plan (Fish and Wildlife Service Fish and Wildlife Service 2002). This Management Unit consists of three rivers in Arizona where flycatchers can likely be found: Nutrioso Creek, Little Colorado River, and Chevelon Creek. The Lower Colorado Recovery Unit is considered one of the least stable Recovery Units throughout the southwestern willow flycatcher's range (Fish and Wildlife Service 2002). In 2002, there were small populations of flycatchers detected near the Little Colorado River at the Greer River Reservoir (one resident, one territory) and near the San Francisco River at the Alpine Horse Pasture (one resident, one territory). According to the Recovery Plan, 50 southwestern willow flycatcher territories and double the amount of habitat are needed in the Little Colorado Management Unit to achieve reclassification to threatened. A total of six flycatcher territories were known in the Little Colorado Management Unit at the end of 2001 (Fish and Wildlife Service 2002).

Little Colorado spinedace

The spinedace is a small (approximately 4 inches) minnow native to the Little Colorado River (LCR) drainage. This fish occurs in disjunct populations throughout much of the LCR drainage. Extensive collections summarized by Miller (1963) indicated that the spinedace had been extirpated from much of the historical range during the period from 1939 to 1960. This species is restricted to north flowing tributaries of the Little Colorado River in Apache, Coconino, and Navajo counties of eastern Arizona.

The Little Colorado spinedace was listed as threatened with critical habitat designated on September 16, 1987 (52 FR 35054). Threats to the survival of spinedace include habitat destruction from impoundment, dewatering, riparian destruction, and other watershed disturbances; use of fish poisons; and the introduction and spread of exotic predatory and competitive fish species. Areas designated as critical habitat includes 31 miles of East Clear Creek, Coconino County, from its confluence with Leonard Canyon upstream to Blue Ridge Reservoir and from the upper end of Blue Ridge Reservoir to Potato Lake; eight miles of Chevelon Creek in Navajo County; and five miles of Nutrioso Creek in Apache County, from the Apache-Sitgreaves National Forests boundary upstream to Nelson Reservoir Dam (U.S. Fish and Wildlife Service 1987). The project area is located 5 miles upstream from critical habitat on Nutrioso Creek. Constituent elements of critical habitat consist of clean, permanent flowing water, with pools and a fine gravel or silt-mud substrate.

Food habits of spinedace include chironomid larvae, dipterians, filamentous green algae, and crustaceans (Runck and Blinn 1993, Blinn and Runck 1990). Spinedace are late spring to early

summer spawners (Blinn 1993, Blinn and Runck 1990, Miller 1961, Minckley 1973, Minckley and Carufel 1967) although some females have been found to contain mature eggs as late as October (Minckley and Carufel 1967). The Little Colorado Spinedace Recovery Plan provides a complete discussion of the taxonomic, distributional, and life history information of the spinedace (Fish and Wildlife Service 1998).

Research on distributional patterns have shown spinedace populations to fluctuate due to variability of physical conditions (Miller 1963, Minckley and Carufel 1967). The spinedace is found in a variety of habitats (Blinn and Runck 1990, Miller 1963, Miller and Hubbs 1960, Nisselson and Blinn 1989). It is unclear whether occupancy of these habitats reflect the local preferences of the species or its ability to tolerate less than optimal conditions. Available information indicates that suitable habitat for the Little Colorado spinedace is characterized by clear, flowing pools with slow to moderate currents, moderate depths, and gravel substrates (Miller 1963, Minckley and Carufel 1967). Cover from undercut banks or large rocks is often a feature. Spinedace have also been found in pools and flowing water conditions over a variety of substrates, with or without aquatic vegetation, in turbid and clear water (Denova and Abarca 1992, Nisselson and Blinn 1991). Water temperatures in occupied habitats ranged from 58° to 78° Fahrenheit (Miller 1963). Miller (1963) called the spinedace “trout like” in behavior and habitat requirements, and it is likely that prior to 1900 the spinedace used habitats now dominated by non-native salmonids.

As with most aquatic habitats in the southwest, the LCR basin contains a variety of aquatic habitat types and is prone to rather severe seasonal and yearly fluctuations in water quality and quantity. Residual pools and spring areas are important refuges during periods of normal low water or drought. From these refuges, spinedace are able to recolonize other stream reaches during wetter periods. This ability to quickly colonize an area has been noted in the literature (Minckley and Carufel 1967). Populations seem to appear and disappear over short time frames and this has made specific determinations on status and exact location of populations difficult. This tendency has been observed by both researchers and land managers (Miller 1963, Minckley 1965, Minckley 1973) and has led to concerns for the species’ survival.

However, populations are generally small and the true population size for any occupied stream is unknown due to the yearly fluctuations and difficulty in locating fish. Spinedace have a tendency to disappear from sampling sites from one year to the next and may not be found for several years. For example, prior to listing in 1987 the Silver Creek population was thought to be extirpated until fish were collected from the creek again in 1997. This ephemeral nature makes management of the species difficult since responses of the population to changes within the watershed cannot be measured with certainty.

Native fishes associated with spinedace include speckled dace (*Rhinichthys osculus*), bluehead sucker (*Pantosteus discobolus*), Little Colorado sucker (*Catostomus* sp.), roundtail chub (*Gila robusta*), and Apache trout (*Oncorhynchus gilae apache*) (Fish and Wildlife Service 1998). The list of non-native fishes is much larger and includes species with varying degrees of incompatibility with the spinedace’s long-term survival. The presence of non-natives was one of the primary reasons the species was listed, and may contribute to the disjunct distribution patterns observed and the spinedace’s retreat to what may be suboptimal habitats. Non-native fish may compete with, prey upon, harass, and alter habitat utilized by native fish. In the last 100 years, at least ten non-native fish species have been introduced into spinedace habitats. These

include rainbow trout (*Oncorhynchus mykiss*), and golden shiner (*Notemigonus crysoleucus*). Data from research experiments and field observations indicate that the rainbow trout is a predator and potential competitor with the spinedace (Blinn *et al.* 1993). Fish surveys conducted by AGFD in 1999 in Nutrioso Creek documented the presence of fathead minnow (*Pimephales promelas*) with Little Colorado spinedace. In addition two native species, bluehead suckers (*Pantosteus discobolus*) and speckled dace (*Rhinichthys osculus*) were also present (Lopez *et al.* 2001).

Since the Little Colorado spinedace was listed, the Rudd Creek population was discovered. Rudd Creek discharges into Nutrioso Creek downstream of Nelson Reservoir. There is currently one refugial population of East Clear Creek spinedace, located at the Flagstaff Arboretum, totaling about 340 individuals. There are no refugial populations for the other two genetic sub-groups. All of the known populations have decreased since 1993 and drought conditions continue to put additional strain on all known populations.

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

The project area, referred to as Enrolled Lands in the SHA, consists of 60 acres located within the EC Bar Ranch. This area is comprised of 2.5 miles of Nutrioso Creek and 100 feet on either side of the stream channel, including the riparian area and associated floodplain. Grazing in the area dates back to the late 1800s. Due to overgrazing and poor range management, Nutrioso Creek has developed into a deeply incised stream channel. Downcutting of the channel has caused a loss in flood plain area and loss of riparian vegetation. Overgrazing by large ungulates, such as livestock and elk, have also contributed to the loss of riparian vegetation. Without an adequate floodplain and associated riparian and streambank vegetation, streamflow is unrestricted, causing an increase in flow velocity. As flow velocities increase, shear stresses acting on the stream banks also increase. These forces have caused streambed and bank erosion.

Nutrioso Creek, both within and outside of the project area, is a deeply incised channel. The floodplain in most areas is very narrow, supporting sparse vegetation with limited foliage density. The riparian area along the stream is supported by perennial/intermittent flows of Nutrioso Creek. Vegetation is comprised of sedges (*Carex* spp.), rushes (*Juncus* spp.), and bulrushes (*Scirpus* spp.) along with grasses and shrubs. The riparian trees established along the channel include coyote willow, shiny willow, strapleaf willow, narrowleaf cottonwood, and thin-leaved alder. These trees are growing as individuals or in small clumps.

The Cooperator bought the EC Bar Ranch in 1996. Knowing that the success of his livestock operation would require restoring and improving the pasturelands, riparian area, and the stream itself, the Cooperator looked for ways to obtain technical and financial assistance to accomplish the necessary improvements.

A restoration plan was developed (through a grant from ADEQ to the Cooperator) to identify the areas for revegetation and the techniques to be implemented (Zeedyk 2002). The current condition of the riparian area and stream channel were characterized. Based on Rosgen's classification system (1996), stream characteristics of entrenchment, sinuosity, width:depth ratio, and slope were used to classify six reaches of Nutrioso Creek that flows through the project area. Table 1 summarizes the physical condition of the stream reaches.

Table 1. Physical condition of the stream reaches on EC Bar Ranch.

Stream Reach	Physical condition
Reach 1	Deep incised channel. Little to no floodplain. Primarily cobble material. High stream banks. Low width:depth ratio. Rosgen type G.
Reach 2	Broad floodplain. Bed and bank materials typically coarse grained. Bed is aggrading. High banks actively sloughing. Rosgen type C-3.
Reach 2A	Highly entrenched. Steep channel slope. Coarse grained, cobble sized bedload. Streambanks poorly vegetated. No floodplain. Rosgen type G or F.
Reach 3	Moderate width:depth ratio. Moderate to high sinuosity. Well vegetated streambanks. Rosgen type C to G.
Reach 4	Actively degrading with advancing headcuts. High terraces being undercut. Heavily used by elk. Rosgen type G.
Reach 5	Not owned by Mr. Crosswhite. Severely down-graded condition. Rosgen type G.
Reach 6	Channel becoming stable. Rosgen type G4, F4 and C4 in various parts of reach.

Outside of the riparian area, at an elevation of 7,600 feet, the vegetation community is comprised primarily of grasses such as blue grama (*Bouteloua gracilis*), western wheat grass (*Agropyron* spp.), and shrubs such as rabbitbrush (*Chrysothamnus nauseosus*) and skunkbush (*Rhus trilobata*). Rabbitbrush is a native weed indicative of deteriorated rangelands (Parker 1972). It often grows in dense stands, replacing good forage grasses which have been killed out by overgrazing. The Cooperator has taken measures to actively remove rabbitbrush through burning, mowing, and root plowing. The areas were then overseeded with perennial and annual grasses.

In 1996, the functional condition of the riparian area in the project area was assessed using the Bureau of Land Management's (BLM) *Process for Assessing Proper Functioning Condition* (1993). The riparian area was assessed to be "Functional-at-risk with a downward trend" in some reaches and "non-functional" in other reaches. In cooperation with the NRCS, the Cooperator developed a Conservation Plan in 1997 to address grazing management issues.

In 1992, 27 miles of Nutrioso Creek from the headwaters to Picnic Creek (a stream length that includes the project area) were listed by ADEQ as having impaired water quality due to exceedances of the State's numeric turbidity standard. High turbidity in a stream typically

indicates excessive sediment loading. The listing required ADEQ to conduct a Total Maximum Daily Load (TMDL) analysis to determine sources of sediment loading from point and nonpoint sources.

In 2000, ADEQ completed and the Environmental Protection Agency (EPA) approved the “Nutrioso Creek TMDL For Turbidity” report (ADEQ 2000). The report recommended that several best management practices be implemented to address the high sediment loading. The Cooperator has implemented these best management practices through grant funds from several State and Federal agencies. Table 2 lists the projects that have been implemented and the funding agency. These projects are included in the current baseline.

Table 2. Projects implemented on EC Bar Ranch.

Project	Agency	Year
Riparian fencing to exclude livestock and large ungulates.	ASL ¹	1998
Install cross fencing to manage livestock grazing.	NRCS & ADEQ	1998, 2002
Rabbitbrush control and/or eradication by burning, mowing and root plowing. Grass seed was then applied.	NRCS & ADEQ	1998, 2000, 2002
Stream grade stabilization structures and riffle weirs were installed to reduce stream velocity and encourage floodplain development.	NRCS & ADEQ	1998, 2002
Installation of wind breaks.	ASL	1999
Water wells and drinkers installed away from the riparian corridor to provide a reliable source of drinking for domestic livestock and wildlife.	ADWR ² , ADEQ	1999, 2002
Diversion structures and pipe were installed to screen out fish and reduce water loss in earth ditches. Water stored in a 250,000 gallon storage tank. A pump efficiently distributes water through pipes to sprinkler units placed in riparian and upland pastures. Timely irrigation helps establish and maintain vegetation on exposed banks and in the stream channel, maintains water table, and keeps pools connected for the benefit of fish populations.	ADEQ	2003
Elk fencing installed and reinforced around 2.5 miles of riparian corridor.	NRCS & ADEQ	2001, 2003
Off-channel drinkers for ungulate use.	ADWR	2001
Installation of bridge so livestock and other animals can cross river without entering the riparian area.	ADEQ	2001
Installation of buffer strip fencing and vegetating buffer areas to reduce erosion.	ADEQ	2002
¹ Arizona State Land Department ² Arizona Department of Water Resources		

The results of these projects have improved the riparian habitat and water quality. In 2002, all reaches of the riparian zone on the EC Bar Ranch were rated in “Functional At Risk in an

upward trend". Various components of the stream and riparian area such as an increase in sinuosity, decrease in width:depth ratio, increase in floodplain and associated vegetation, and improvements to upland vegetation have contributed to this improved rating. Revegetating the floodplain will provide additional stream stability and will assist in the continuation of this upward trend.

Status of the Species Within the Action Area

Southwestern willow flycatcher

The project area was surveyed for birds including southwestern willow flycatchers in January and June 2001. The results of the January and June surveys determined that no birds were found to occupy the area. Although no southwestern willow flycatchers would be expected to be found during January because they are neotropical migrants, they would be expected to be found during June, which falls within their breeding period, if they were present in the project area. Because there is an absence of suitable habitat, no surveys were conducted in 2002 or 2003.

The closest known breeding location for the southwestern willow flycatcher is approximately 9 miles southwest of the project area near the town of Alpine, Arizona. In 2003, one territory and one pair were detected at this site.

Another location where southwestern willow flycatchers have been known to breed is approximately 15 miles west of the project area near the town of Greer, Arizona, where two territories were detected.

Little Colorado spinedace

In October, 1999, AGFD fisheries biologists conducted a fisheries survey on Nutrioso Creek, including a portion on the Cooperator's property (Lopez *et al.* 2001). In addition to fish, the AGFD also collected water quality information, and inventoried the aquatic habitat using General Aquatic Wildlife Survey (GAWS) methodology. On the Cooperator's property, there were three stations established along 1.27 miles of stream, each 165 feet in length. Fish were collected using a Smith/Root electrofisher. A total of 287 fish were collected in the three stations surveyed. Four species of fish were collected (relative abundance is shown in parenthesis); fathead minnow, (*Pimephales promelas*), (65.9%); Little Colorado spinedace, (14.3%); speckled dace, (*Rhinichthys osculus*), (12.5%); and bluehead sucker, (*Pantosteus discobolus*), (7.3%). Based on this information, AGFD estimated that the 1.56 acres of aquatic habitat on the Crosswhite property (1.27 miles or 6,705 feet times a mean width of 10.2 feet) supported a fish population of 619 Little Colorado spinedace at the date of sampling.

The AGFD fish survey also noted an abundance of crayfish throughout the range of the Little Colorado spinedace in Nutrioso Creek. Inman *et al.* (1998) identified the crayfish from Nutrioso Creek as the northern crayfish (*Orconectes virilis*). Crayfish are considered a threat to native fishes. Predation on Little Colorado spinedace eggs by crayfish has been documented by White (1995).

Using the Habitat Condition Index, a multivariate rating system for evaluating existing trout habitat, AGFD rated Nutrioso Creek on the Cooperator's property as 59.20, which is just below

“good” (a “good” index has a rating of 60.00). To improve native fish native fish habitat in Nutrioso Creek, the AGFD fish survey report recommends improving bank stability, riparian vegetation and turbidity through strict grazing management (Lopez *et al.* 2001).

There have not been many section 7 consultations that have involved this portion of the Nutrioso Creek population of spinedace. The nearest and most recent project that underwent formal consultation was in 2002. The project involved a crayfish study to be conducted by the Forest Service (2-21-02-F-0220). Gee minnow traps would be placed in pool habitat within 3 miles downstream or upstream of two USGS stream gauges on Nutrioso Creek. A biological opinion was issued in 2001 for another project which involved stocking of rainbow trout into three reservoirs, one of which was Nelson Reservoir (2-21-92-F-403R). Nelson Reservoir is located 5 miles downstream of the proposed action area on the Apache-Sitgreaves National Forest (ASNF). In 1999, a biological opinion was issued to the ASNF on the effects of livestock grazing on spinedace in the Colter and Riggs Creek watersheds. Both of these creeks discharge into Nutrioso Creek downstream of the project. Effects to spinedace habitats from direct access of livestock to streamside habitats, from road placement and maintenance, and from recreation were considered. Since the location of the proposed action area is upstream of the former consultations, there is a small likelihood that the baseline condition of the action area was affected. The extent to which the condition of the river in the action area was affected is unknown and would be very difficult to estimate.

EFFECTS OF THE ACTION

The overall effects of the proposed action should be beneficial, as the SHA is designed to provide a net conservation benefit for the above described species. The net conservation effect will occur through restoring and enhancing riparian and aquatic habitat for these species. In addition, this action should directly or indirectly contribute to recovery of the above described species.

Revegetation activities will take place on the floodplain and will occur starting January 2004. The revegetation activities will continue until April depending on weather and instream conditions. There may be problems with acquiring sufficient plant material for planting the first year. If that occurs, additional planting may be done the following year (January 2005 to April 2005). Additional plantings in subsequent years may be done in case there are tree mortalities or additional pole cuttings become available.

Listed species/critical habitat

Southwestern willow flycatcher

The southwestern willow flycatcher will benefit directly from revegetating the floodplain with riparian vegetation. Planting native woody riparian species will help restore riparian habitat, increasing the probability that flycatchers could occur on the property in the future. Southwestern willow flycatchers do not currently occur in the project area and site potential for this species is currently limited. Because the habitat is not currently suitable and is not occupied, there will be no direct effects to the flycatcher.

In the event that revegetation activities improve riparian habitat conditions by increasing or establishing woody riparian trees, the improvement would benefit flycatchers by increasing the availability of potential migration and nesting habitat.

Proposed harvesting of riparian vegetation would occur 2 to 4 years after the riparian vegetation has been planted. The cuttings would be used in revegetation projects in the region. Although no revegetation projects have been identified at this time, this would increase the potential of increasing the availability of riparian habitat which would contribute to the recovery of this species. When projects are known, FWS will work with the Cooperator to determine if the riparian trees planted are of sufficient size and whether or not cuttings can be taken. Factors that will be used to make the determination include, but are not limited to, number of stems produced per tree, cutting length, stem diameter, and timing of harvest. Harvesting will be conducted in such a manner to maintain both the riparian habitat that has been established and improved stream functions for native fish.

It is possible that flycatchers may occupy the action area at some time during the life of the project. The growing season for vegetation in this region generally starts in late May. Flycatchers at higher elevations sites usually begin breeding several weeks later than those in lower or southern areas (U.S. Fish and Wildlife 2002). This means that flycatchers that may occur in this area would begin breeding sometime in late May. In 2003, flycatchers did not arrive at the Alpine site until sometime after June 1 (Smith, AGFD, pers. comm). Since harvesting of riparian vegetation will be conducted when flycatchers do not occupy the area (December through March) and the planted trees will have sufficient time to begin growth before flycatchers migrate to this area, there will be no effect on the flycatchers.

The elk fence improvements will strengthen the existing fences that were installed in 1998. Effects of this action will continue to preclude elk and livestock from entering the stream which help in the establishment of the newly planted pole cuttings. In addition, this will eliminate the possibility of trampling of vegetation as well as streambanks by large ungulates. The improved elk fences will not adversely affect the flycatchers.

Little Colorado spinedace

This revegetation project is designed to improve water quality as well as improve riparian and aquatic habitat in the project area. The increase of vegetation on the floodplain will increase resistance of streamflow thus slowing streamflow velocity. Turbidity will be reduced due to vegetation stabilizing streambank sediments and trapping in-stream sediments. Baseflow in the stream will increase due to the increase of water in the capillary zone of stream sediment. The increase in baseflow will reduce the length and duration of no stream flow during the dry summer season.

During the revegetation activities, work will be conducted on the floodplain and not in the stream channel. If sediment enters the stream channel it would be minimal and temporary. Spawning for the Little Colorado spinedace occurs in early summer, after planting activities have been completed; therefore, spawning activities will not be interrupted. If sediment enters the stream channel the impact to the macroinvertebrate population, one of the food sources for spinedace, would be minimal. Since the revegetation activity will occur during the winter when metabolic rates of spinedace will be lower and requiring less food, this effect is expected to be negligible.

Harvesting of riparian vegetation will occur on the floodplain. Workers do not need to enter the stream channel except to harvest any branches that overhang the channel. Disturbance to the stream sediments will be localized and temporary. There will be a negligible effect to the spinedace in the area.

Improvements to the existing elk fences will maintain exclusion of large ungulates from entering the stream channel. This will have positive benefits such as eliminating trampling of streambanks and stirring up of sediments in the stream. The improved elk fences will have a positive effect for the spinedace.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, local or private actions 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 following section 7 of the Act.

Implementation of this revegetation project on the EC Bar Ranch as well as having the SHA may generate other revegetation projects in the region. Landowners in the region may inquire about how this project was funded and how the Cooperator was able to obtain assistance in dealing with threatened and endangered species through a SHA. The Cooperator may be in a better position able to obtain additional grants by conducting his revegetation project successfully. If additional projects were to be implemented in this region, these projects would increase riparian habitat and assist listed species.

This project should improve the water quality, water quantity, and stream channel physical integrity of Nutrioso Creek on the EC Bar Ranch. Several of these improvements will very likely continue downstream. The riparian habitat should also increase due to the revegetation activities. These improvements will have a positive effect for the southwestern willow flycatcher and Little Colorado spinedace both in the project area and downstream of Nutrioso Creek.

Grazing by livestock and elk will continue on adjacent lands. In the intra-Service section 7 consultation completed for this project, grazing was been implicated as the major cause for the degraded riparian conditions, sloughing stream banks, and the absence of riparian vegetation along Nutrioso Creek. Exclusion of elk and livestock in the riparian area has shown to be an important component to the restoration of Nutrioso Creek on the EC Bar Ranch, and is expected to continue with the proposed action.

CONCLUSION

Listed species /critical habitat

After reviewing the current status of the southwestern willow flycatcher and the Little Colorado spinedace, the environmental baseline for the action area, the effects of the proposed issuance of a section 10(a)(1)(A) Safe Harbor Enhancement of Survival Permit on 60 acres of the EC Bar Ranch, and cumulative effects, it is our biological opinion that this action, as proposed, is not likely to jeopardize the continued existence of these species. No critical habitat has been

designated for the flycatcher, therefore, none will be affected. Critical habitat for the Little Colorado spinedace has been designated in areas of Arizona, however, this action would not affect those areas and no destruction or adverse modification of critical habitat will occur as a result of this project.

The conclusions of the biological opinion are based on the full implementation of the project as described in the Description of the Proposed Action section of this document, including any conservation measures incorporated into the project design.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined (50 CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined (50 CFR 17.3) as intentional or negligent 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 defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. 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 to be prohibited taking under the Act, provided that such taking is in compliance with the terms and conditions of this incidental take statement.

The SHA for the EC Bar Ranch clearly identifies the management activities that will be implemented to provide a net conservation benefit to and a contribution to recovery of the affected listed species included in the section 10(a)(1)(A) permit. The anticipated impacts to affected listed species likely to result from the proposed taking should the Cooperator return to the agreed upon baseline conditions have been identified in the SHA. All management activities described in the SHA and any section 10(a)(1)(A) permit, are hereby incorporated by reference as reasonable and prudent measures and terms and conditions within the incidental take statement pursuant to 50 CFR §402.14(i). Such terms and conditions are non-discretionary and must be undertaken for the exemptions under section 10(a)(1)(A) and section 7(o)(2) of the Act to apply. If the Cooperator fails to adhere to these terms and conditions, the protective coverage of the section 10(a)(1)(A) permit and section 7(o)(2) may lapse. However, the Fish and Wildlife Service and the Cooperator may agree that modifications to the management activities are needed. These new modifications will be incorporated as reasonable and prudent measures, superseding the former management activities.

I. AMOUNT OR EXTENT OF TAKE

Listed species /critical habitat

If habitat improvements result in occupancy by the any of these species, and the Cooperator chooses to return the restored habitat to baseline conditions (e.g., through activities such as clearing for agricultural purposes, intensive grazing, discontinuing habitat enhancement, or other

activities), incidental take of these species may occur. The extent of incidental take that may result from such activities will depend on the extent to which the restored habitat is occupied by the species.

Southwestern willow flycatcher

Revegetation will be carried out in currently unoccupied, unsuitable habitat (zero baseline). Therefore, no incidental taking of southwestern willow flycatcher is anticipated for revegetation activities at the inception of project implementation. It is our opinion that it is a possibility that flycatchers may occupy the action area sometime in the future, although it is unlikely. Because the baseline for the southwestern willow flycatcher is zero, if the Cooperator decides to take his property back to baseline conditions as provided under the provisions of the SHA, all southwestern willow flycatchers that occupy this area could be taken under this permit.

Little Colorado spinedace

It is anticipated that take of Little Colorado spinedace is not reasonably foreseeable due to the revegetation activities. If the Cooperator decides to return his property back to baseline conditions, FWS anticipates incidental take of the spinedace will be difficult to detect and quantify. As stated earlier in the biological opinion document, spinedace populations can fluctuate due to variability of physical conditions. Therefore, incidental take is related to the number of riparian trees established prior to initiating the project. The Cooperator is authorized to remove vegetation up to 100 individual or clumps of riparian trees. Actual numbers of spinedace taken will be difficult to see in the water due to the small size of the individual fish, any injured or dead individuals being washed downstream out of the project area, and the small size of the population in the area. Additionally, if any mortality or injured fish are detected, the cause will be difficult to ascertain. Therefore, if more than 100 individual or clumps of riparian trees are removed, take will be considered to be exceeded.

This is the total level of take anticipated for the proposed actions as described in the Description of Proposed Action section of this opinion. Absent written agreement to the contrary or waiver, the Cooperator shall notify the Fish and Wildlife Service at least 60 days in advance of when he expects to carry out an activity that is likely to result in the taking of a listed covered species to provide FWS with an opportunity to rescue affected individuals of such species, if possible and appropriate. Such notification shall be provided to:

Field Supervisor
U. S. Fish and Wildlife Service
Arizona Ecological Services Field Office
2321 W. Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Phone: 602/242-0210

II. EFFECT OF THE TAKE

In the accompanying biological opinion, FWS determined that these levels of anticipated take are not likely to result in jeopardy to any of the above species affected by the SHA or destruction or adverse modification of critical habitat.

III. REASONABLE AND PRUDENT MEASURES and TERMS AND CONDITIONS

FWS believes the following reasonable and prudent measure is necessary and appropriate to minimize or avoid impacts of incidental take to the southwestern willow flycatcher and Little Colorado spinedace.

1. The Fish and Wildlife Service shall require that the applicant comply with and implement the issued section 10(a)(1)(A) incidental take permit.

There are no additional reasonable and prudent measures required if this project is implemented as proposed.

The reasonable and prudent measure, with the implementing terms and conditions, are designed to minimize or avoid the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. James W. Crosswhite must immediately provide an explanation of the causes of the taking and review with FWS the need for possible modification of the reasonable and prudent measures.

Disposition of Dead or Injured Listed Animals

Upon finding a dead or injured threatened or endangered animal, initial notification must be made to the Fish and Wildlife Service's Law Enforcement Office, 2450 W. Broadway Rd. #113, Mesa, Arizona 85202 (480/967-7900) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph, and any other pertinent information. Care must be taken in handling injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible condition. If feasible, the remains of intact specimens of listed animal species shall be submitted as soon as possible to this office or the nearest AGFD office, educational, or research institutions (e.g., Arizona State University in Tempe) holding appropriate State and Federal permits.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution before implementation of the action. A qualified biologist should transport injured animals to a qualified veterinarian. Should any treated listed animal survive, FWS should be contacted regarding the final disposition of the animal.

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. We recommend the following:

1. The AESO should seek to participate with the Cooperator to implement adaptive management procedures to regularly assess and improve attainment of the restoration goals of the SHA.
2. The AESO should seek to amend the SHA to include any species that become listed during its duration, as appropriate.

In order for FWS to be kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

REINITIATION NOTICE

This concludes formal consultation and conference on the actions outlined in the request. 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 retained (or is authorized by law) and if: (1) the amount or extent of 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 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, please contact Kris Randall (602) 242-0210 (x 250) or Marty Jakle (620) 242-0210 (x 213).

/s/ Steven L. Spangle

cc: John Kennedy, Habitat Branch, Arizona Department of Game and Fish, Phoenix, AZ
Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
(Attn: Bryan Arroyo)

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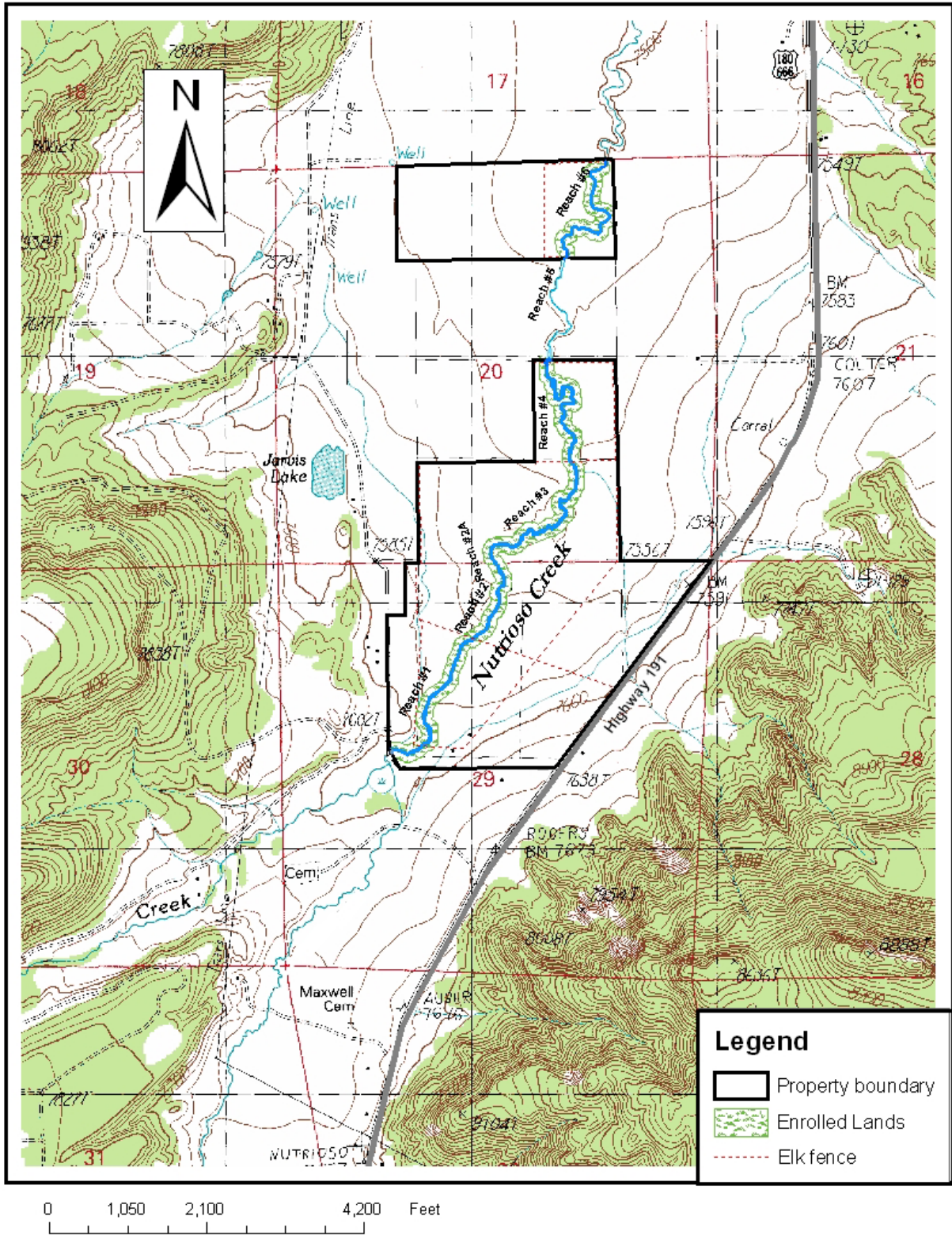


Figure 1. Enrolled lands for Safe Harbor Agreement on the EC Bar Ranch of James W. Crosswhite. Nutrioso Creek has been divided into seven reaches for the revegetation activities.