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In Reply Refer To:

AESO/SE
02-21-95-F-0303-R1

November 5, 2004

Karl P. Siderits
Forest Supervisor
Tonto National Forest
2324 East McDowell Road
Phoenix, Arizona 85006

Dear Mr. Siderits:

Thank you for your July 7, 2004, request for reinitiation of formal section 7 consultation under the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531-1544 et seq.). At issue are impacts that may result from maintenance of Walnut Spring, the reestablishment of desert pupfish (*Cyprinodon macularius*, pupfish) in Walnut Spring, the continued use of a 10-year term permit to graze livestock on the Cross F Allotment, and other Forest Service activities that may potentially affect pupfish and Gila topminnow (topminnow; *Poeciliopsis occidentalis occidentalis*) Walnut Spring is near Sunflower, Maricopa County, Arizona. Your letter and subsequent telephone conversations between our staffs concluded that the proposed action may affect, and is likely to adversely affect, the pupfish and topminnow.

This biological opinion is based on information provided in your biological assessment and evaluation, various supporting documents, meetings, telephone conversations, electronic mail messages, field investigations, and other sources of information. A complete administrative record of this consultation is on file at the Phoenix, Arizona Ecological Services Field Office (AESO).

Consultation History

September 12, 1995	We issued a biological opinion on issuance of a 10-year term grazing permit to graze the Cross F allotment.
October 4, 2001	FWS and Tonto National Forest (Tonto NF) staff conducted a site visit to Walnut Spring.
January 24, 2003	FWS, Tonto NF, and Arizona Game and Fish Department (AGFD) staff conducted a site visit to Walnut Spring.
June 21, 2004	We met with Tonto NF, AGFD, and the Cross F allotment permittees to discuss maintenance of Walnut Spring Pond and stocking of desert pupfish into Walnut Spring.
July 7, 2004	We received your initial request for formal consultation on the reestablishment of desert pupfish into Walnut Spring, and the effects of maintenance of Walnut Spring and ongoing grazing in the Cross F allotment on desert pupfish and Gila topminnow.
July 15, 2004	In a telephone conversation, Bob Calamusso clarified that the effects determination for both Gila topminnow and desert pupfish was may affect, likely to adversely affect, and that the scope of the consultation should include all activities currently occurring under Tonto NF jurisdiction at Walnut Spring.
July 27, 2004	We responded to your request for formal consultation with a letter initiating consultation.
July-September, 2004	We coordinated development of the biological opinion with Tonto NF staff, AGFD staff, and the permittees for the Cross F Allotment.

BIOLOGICAL OPINION

Description of the Proposed Action

This consultation addresses the effects of reestablishing desert pupfish into Walnut Spring, maintenance of Walnut Spring, continuing livestock grazing under a 10-year term grazing permit, and other actions expected to occur that could affect Gila topminnow and desert pupfish. The primary purpose of the proposed action is to reestablish a species, desert pupfish, in Walnut Spring, and to enhance the spring to maintain water for fish habitat and livestock watering. Livestock will continue to use the water as they have for years under a Tonto NF permit and a biological opinion issued in 1995 (U.S. Fish and Wildlife Service 1995).

The action area for this consultation is Walnut Spring, its associated pond, and the fenced enclosure containing the spring and pond. This enclosure contains essentially the entire drainage of the spring and pond, which is less than 0.5 acre.

Walnut Spring is a small spring impounded to form a shallow pond and is located approximately 3.5 miles northwest of Sunflower (T6N, R8E, Sec 3). Access to the pond is gained only via a 4-wheel drive road, Forest Route 393 (see Figure 1). Discharge from the spring is not known but estimated to be only a few gallons per minute. The spring and pond are located on a hillside above a natural drainage and are not exposed to flooding. Walnut Spring is in an unnamed tributary to Alder Creek, which ultimately flows into Bartlett Reservoir on the Verde River. Discharge from Walnut Spring pond extends for a short distance (approximately 100 feet depending on season and weather) downstream in the tributary but does not reach Alder Creek. Alder Creek is dry or intermittent for most of its length.

Because this consultation addresses the addition of a listed species, desert pupfish, to Walnut Spring, the Tonto NF requested we consider all foreseeable actions in the action area under their authority (R. Calamusso, Tonto NF, pers. comm. 2004). This includes maintenance actions on the pond in perpetuity, which could include dredging, rebuilding the berm, vegetation clearing, fencing to partially or completely exclude livestock grazing from the spring, and installing an offsite drinker or water trough via piping with a safety valve. This does not include actions that could occur in the future for which Tonto NF currently has no plan (e.g. prescribed fire, new roads, grazing improvements not mentioned here) and also does not include emergency actions (i.e. wildfire suppression).

Grazing

Cross F allotment is grazed under a rest-rotation system with five pastures. Walnut Spring is in a holding pasture within Alder pasture. Walnut Spring is accessible to livestock during the time they are in Alder pasture, but access is prevented when cattle are being gathered and moved to the next pasture. Walnut Spring exclosure is also not to be used as a trap when gathering the Alder Creek pasture. Preventing access by livestock to Walnut Spring during gathering operations avoids the highest concentrations of livestock use in the Walnut Spring area. The timing, use, yearlong rest, and grazing deferment of the Alder Creek pasture is as described in the AMP; livestock numbers are not to exceed 350 (see also U.S. Fish and Wildlife Service 1995). With respect to grazing, the proposed action remains essentially unchanged from that described in the previous consultation (02-21-95-F-0303).

Maintenance

The purpose of the maintenance aspect of the project is to increase the water level in the pond by 0.5 to 1.0 foot and protect the berm and outflow of the pond from destabilization and erosion by livestock impact, and to allow for any potential actions that might become necessary to maintain the pond, road, and fences in the future. The project will include placing a single or double layer of soil and gravel along the berm of the pond (about 40 feet long x 3 feet wide) and constructing

an erosion-resistant outflow channel (Figure 2). Livestock may be restricted from crossing the berm and outflow by fencing and permanently closing the east gate. In addition, the pond may be modified to pipe water outside the spring enclosure to a watering trough (drinker) in the Alder pasture, and cattle may be excluded from the pond. Note that the proposed action includes any future action to add piping and a drinker or water trough. The option to graze cattle will not be abandoned entirely, as grazing likely prevents the pond from becoming overgrown with vegetation.

In addition to the resurfacing and raising of the berm, and fencing to control livestock movement, dredging of the pond may also be used to increase pond volume. Dredging may be accomplished via hand tools (e.g. shovels and buckets) or heavy equipment (e.g. a backhoe). Dredged silt will be placed on the NW portion of the berm to aid in water retention. Before dredging, topminnow and pupfish, once established will be captured and held on site until operations are completed. Fish will then be returned to the pond. Vegetation removal by hand tools or heavy equipment may also be necessary if cattle use is altered or a drinker is installed.

Any of the pond maintenance activities described above may be necessary at multiple times in the future, and these future actions are also considered part of the proposed action. AGFD will remove as many Gila topminnow and desert pupfish as possible before conducting pond maintenance and will hold all fish on site in aerated water tanks, and will return all fish to the pond once maintenance is completed. The collection of fish is covered under the 10(a)(1)(A) recovery permit of AGFD and is not considered part of this proposed action.

The Tonto NF and the permittee routinely maintain roads, allotment fences, and pasture fences. Maintenance of Forest Route 393, including grading and fence maintenance of the enclosure around Walnut Spring and adjacent pastures, are also considered part of the proposed action.

Fish Translocation

Once pond maintenance has been completed, Tonto National Forest and AGFD will introduce desert pupfish into the pond. AGFD will transport fish to the site in tanks and follow existing protocols for acclimation and transfer of desert pupfish into the spring pond. Translocation of desert pupfish from a source population to Walnut Spring will be covered by Arizona Game and Fish 10(a)(1)(A) recovery permits and is not considered part of the proposed action under consultation. AGFD and Tonto NF will coordinate the translocation with the FWS Arizona Ecological Services Office (AESO).

Monitoring

The Forest Service proposes to provide to the AESO an annual monitoring report that includes riparian and upland utilization and streambank alteration, including the condition of the pond and berm that retains the pond. If either the Forest Service or we determine, based on this annual confirmation, that the terms of the proposed action are not being met, the effects of authorized grazing on the allotment and associated allotment management plan will be reevaluated, and reinitiation of consultation may be required. AGFD will continue to monitor topminnow and pupfish at least annually, following established protocols, and will provide reports to the Tonto

NF and FWS. The effects of monitoring will be covered under the AGFD 10(a)(1)(A) permit and are not considered part of the proposed action under consultation.

STATUS OF THE SPECIES

Gila topminnow

Gila topminnow (*Poeciliopsis occidentalis occidentalis*) belong to a group of live-bearing fishes within the family Poeciliidae that includes the familiar guppy (*Poecilia reticulata*), which is not native to the Gila basin. Males are smaller than females, rarely greater than 1 inch, while females are larger, reaching 2 inches. Body coloration is tan to olivaceous, darker above, lighter below, often white on the belly. Breeding males are usually blackened, with some golden coloration of the midline, and with orange or yellow at the base of the dorsal fin.

Gila topminnow mature a few weeks to many months after birth, depending on when they are born. They breed primarily from March to August, but some pregnant females occur throughout the year (Schoenherr 1974). Some young are produced in the winter months. Minckley (1973) and Constantz (1980) reported that Gila topminnow are opportunistic feeders which eat bottom debris, vegetation, amphipods, and insect larvae when available.

Gila topminnow and many other poeciliids can tolerate a variety of physical and chemical conditions. They are good colonizers in part because of this tolerance and in part because a single gravid female can start a population (Meffe and Snelson 1989). Minckley (1969, 1973) described their habitat as edges of shallow aquatic habitats, especially where abundant aquatic vegetation exists. Simms and Simms (1992) found the densities of Gila topminnow in Cienega Creek, Pima County, Arizona, to be greater in pool, glide, and backwater habitats and less dense in marsh, riffle, chute, cascade, and fall habitats. They occurred more frequently over sand substrates than over other categories of substrates. Although Gila topminnow may occupy pools and ponds that are up to 6 feet deep, they are normally found in the upper one-third of the water column (Forrest 1992).

Gila topminnow is known to occur in streams fluctuating from 51-99^{o} F, pH from 6.6 to 8.9, dissolved oxygen levels of (2.2-11 ppm), and can tolerate salinities approaching those of sea-water (Meffe et al. 1983). Topminnow can burrow under mud or aquatic vegetation when water levels decline (Deacon and Minckley 1974, Meffe et al. 1983). Sonoran topminnow (including both Gila and Yaqui (*P. o. sonoriensis*) subspecies) regularly inhabit springheads with high loads of dissolved carbonates and low pH (Minckley et al. 1977, Meffe 1983, Meffe and Snelson 1989). This factor has helped protect small populations of topminnow from mosquitofish (*Gambusia affinis*) that are usually rare or absent under these conditions (Meffe 1983).

The Gila topminnow was listed as endangered in 1967 without critical habitat (U.S. Fish and Wildlife Service 1967). The species was later revised to include two subspecies, *P. o. occidentalis* (Gila topminnow) and *P. o. sonoriensis* (Yaqui topminnow) (Minckley 1969, 1973). *Poeciliopsis occidentalis*, including both subspecies, is collectively known as the Sonoran topminnow. Both subspecies are protected under the ESA. Only Gila topminnow populations in the United States, and not in Mexico, are listed under the Act. The reasons for decline of this

fish include past dewatering of rivers, springs, and marshlands, impoundment, channelization, diversion, regulation of flow, land management practices that promote erosion and arroyo formation, and the introduction of predacious and competing nonnative fishes (Miller 1961, Minckley 1985). Other listed fish suffer from the same impacts (Moyle and Williams 1990).

Gila topminnow are highly vulnerable to adverse effects from nonnative aquatic species (Johnson and Hubbs 1989). Predation and competition from nonnative fishes have been major factors in their decline and continue to be a major threat to the remaining populations (Meffe et al. 1983, Meffe 1985, Brooks 1986, Marsh and Minckley 1990, Stefferud and Stefferud 1994, Weedman and Young 1997). The native fish fauna of the Gila basin, and of the Colorado basin in general, was naturally depauperate and contained few fish that were predatory on or competitive with Gila topminnow (Carlson and Muth 1989). In the riverine backwater and side-channel habitats that formed the bulk of Gila topminnow natural habitat, predation and competition from other fishes was essentially absent. Thus, Gila topminnow did not evolve mechanisms for protection against predation or competition and is predator- and competitor-naive. With the introduction of large numbers of predatory and competitive nonnative fish, frogs, crayfish, and other species, the Gila topminnow could no longer survive in many of its habitats, or the small pieces of those habitats that had not been lost to human alteration. Both large (Bestgen and Propst 1989) and small (Meffe et al. 1983) nonnative fish cause problems for Gila topminnow as can nonnative crayfish (Fernandez and Rosen 1996) and bullfrogs.

Historically, the Gila topminnow was abundant in the Gila River drainage and was one of the most common fishes of the Colorado River basin, particularly in the Santa Cruz system (Hubbs and Miller 1941). This was reduced to only 15 recent naturally occurring populations. Presently, only 12 of the 15 recent natural Gila topminnow populations are considered extant (Weedman and Young 1997). Only three (Cienega Creek, Monkey Spring, Cottonwood Spring) have no nonnative fish present and therefore can be considered secure from nonnative fish threats. There have been at least 175 wild sites stocked with Gila topminnow; however, topminnow persist at only 18 of those localities. Of the 18, one site is outside topminnow historical range and four now contain nonnative fish (Weedman and Young 1997). Further, only five of these stocked populations would count toward recovery under the draft revised Gila topminnow recovery plan (Abarca et al. 1994).

The status of the species is poor and declining. Gila topminnow has gone from being one of the most common fishes of the Gila basin to one that exists at not more than 30 localities (12 natural and 18 stocked). Many of these localities are small and highly threatened. The theory of island biogeography can be applied to these isolated habitat remnants, as they function similarly (Meffe 1983, Laurenson and Hocutt 1985). Species on islands are more prone to extinctions than continental areas that are similar in size (MacArthur and Wilson 1967). Meffe (1983) considered extinction of Gila topminnow populations almost as critical as recognized species extinctions, and Moyle and Williams (1990) noted that fish in California that are in trouble tend to be endemic, restricted to a small area, part of fish communities with fewer than five species, and found in isolated springs or streams. Gila topminnow has most of these characteristics.

The highest priority actions in the draft revised Gila topminnow recovery plan are ones that are absolutely essential to prevent extinction in the foreseeable future (Weedman 1999). Federal

actions have contributed to the degraded environmental baseline of the Gila topminnow. Federal actions requiring section 7 consultations affecting Redrock Canyon, Cienega Creek, and Sonoita Creek in the Santa Cruz River subbasin and others in the Gila Giver basin have contributed to the lowered baseline for the Gila topminnow. An indication of the poor status of the species is that two formal consultations have resulted in jeopardy biological opinions. Although the reasonable and prudent alternatives removed jeopardy, other adverse effects are not totally removed by the reasonable and prudent alternatives. Other Federal actions, as well as non-Federal actions that have not undergone section 7 consultation, also have some unmitigated adverse effects that contribute to the degraded baseline. Fortunately, recovery actions continue for this species, although some projects have been more successful than others.

Desert pupfish

In Arizona, the genus Cyprinodon is comprised of three species, desert pupfish (*Cyprinodon macularius)*, Quitobaquito pupfish (*C. eremus*, Echelle et al. 2000), and an extinct form, the Santa Cruz pupfish (*C. arcuatus*, Minckley et al. 2002). The desert pupfish and Quitobaquito pupfish were listed as endangered species with critical habitat on April 30, 1986 (U.S. Fish and Wildlife Service 1986 [51 FR 10842]). Critical habitat for the Quitobaquito pupfish was designated in Arizona at Quitobaquito Springs, Organ Pipe Cactus National Monument, Pima County. The Mexican government has also listed the species as endangered [Secretaria de Desarrollo Urbano y Ecologia (SEDUE) 1991].

A small fish, the desert pupfish is less than 3 inches long (Minckley 1973). The body is thickened, chubby or strongly laterally compressed in males; coloration is a silvery background with narrow dark vertical bars on the sides. Males are larger than females and become bright blue during the breeding season. Spawning occurs from spring through autumn, but reproduction may occur year-round depending on conditions (Constanz 1981). Eggs are laid loose over soft substrates. Under limited breeding habitat and high population densities, males are highly territorial and patrol and defend territories (Barlow 1961). Females lay only one egg at a time but one female produces 50-800 eggs per season (Constantz 1981). The life span of an individual is one to three years (Minckley 1973). The desert pupfish feeds on invertebrates, algae, and organic debris (Minckley 1973, Naiman 1979). The desert pupfish appears to go through cycles of expansion and contraction in response to natural climatological variation (U.S. Fish and Wildlife Service 1986, 1993; Weedman and Young 1997). In very wet years, populations can rapidly expand into new habitats (Hendrickson and Varela 1989). In historical times, this scenario would have led to panmixia among populations over a very large geographic area (U.S. Fish and Wildlife Service 1993).

The historical distribution of desert pupfish in Arizona included the Gila, San Pedro, and Salt rivers, and likely the Hassayampa, Verde, and Agua Fria rivers, although collections are lacking for the latter three drainages. The desert pupfish is also found in the lower Colorado River, Salton Sink basin, and Laguna Salada basin (Eigenmann and Eigenmann 1888; Garman 1895; Gilbert and Scofield 1898; Evermann 1916; Thompson 1920; Jordan 1924; Coleman 1929; Jaeger 1938; Miller 1943; Minckley 1973, 1980; Black 1980; Turner 1983; Hendrickson and Varela 1989; Echelle et al. 2000). Historical collections occurred in Baja California and Sonora, Mexico, and in the United States in California and Arizona.

Since the 19th century, desert pupfish habitat has been steadily destroyed by streambank erosion, the construction of water impoundments that dewatered downstream habitat, excessive groundwater pumping, the application of pesticides to nearby agricultural areas, and the introduction of non-native fish species (Matsui 1981, Hendrickson and Minckley 1985, Minckley 1985, Schoenherr 1988). The non-native bullfrog may also prove problematic in the management of desert pupfish. The bullfrog is an opportunistic omnivore with a diet that includes fish (Frost 1935, Cohen and Howard 1958, Brooks 1964, McCoy 1967, Clarkson and deVos 1986). There is also a concern that introduced salt cedar (*Tamarisk* spp.) next to pupfish habitat may cause a lack of water at critical times (Bolster 1990; R. Bransfield, U.S. Fish and Wildlife Service, pers. comm., 1999). Evapotranspiration by luxuriant growth of this plant may especially impact smaller areas of habitat where water supply is limited. The remaining populations continue to face these threats.

Naturally occurring populations of desert pupfish are now restricted in the United States to California in two streams tributary to, and in shoreline pools and irrigation drains of, the Salton Sea (Lau and Boehm 1991). The species is found in Mexico at scattered localities along the Colorado River Delta and in the Laguna Salada basin (Hendrickson and Varela-Romero 1989, Minckley 2000). About 20 transplanted populations exist in the wild (U.S. Fish and Wildlife Service 1993). The range-wide status of desert pupfish is poor but stable. The future of the species depends heavily upon future developments in water management of the Salton Sea and Santa Clara Cienega in Mexico. Additional life history information can be found in the recovery plan (U.S. Fish and Wildlife Service 1993) and other references cited there.

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 action area in this consultation is extremely small, and consists of Walnut Spring, its associated pond, and the fenced enclosure containing the spring and pond. This enclosure captures essentially the entire drainage of the spring and pond, and is less than 0.5 acre in size (see Figures 1 and 2).

Walnut Spring occurs in the Alder pasture of the Cross F allotment, in the Mesa District of Tonto National Forest. The allotment is dominated by semi-desert grassland and chaparral, but also includes desert scrub, pinyon-juniper (*Juniperus* spp.-*Pinus* spp.), riparian, and conifer vegetation types. The desert scrub type covers a small portion of the allotment and occurs in lower Canyon and Alder creeks at the lowest elevations. Pinyon-juniper is limited to small areas along the eastern side of the allotment. Coniferous vegetation, including Arizona cypress (*Cupressus arizonica*), Douglas fir (*Pseudotsuga menziesii*), and ponderosa pine (*P. ponderosa*) are limited to the north end of the allotment and to drainage bottoms and northern aspects.

Riparian areas are present in the east and west forks of Sycamore Creek, main Sycamore Creek, Kitty Joe, Alder, and Sheep creeks, and a small, unnamed drainage that enters Sycamore Creek in the south half of section 36, T7N, R8E. These areas support a variety of plants including Arizona sycamore (*Platanus wrightii*), Arizona cypress, Arizona walnut (*Juglans major*), netleaf hackberry (*Celtis reticulata*), mesquite (*Prosopis juliflora*), catclaw (*Acacia greggii*), willow (*Salix* spp.), Fremont cottonwood (*Populus fremontii*), Emory oak (*Quercus emoryi*), and a large variety of herbaceous plants.

Walnut Springs was, at one time, a spring originating from the side of a steep hill. A pond was excavated out of the hillside in 1951 to increase accessibility to water for livestock. The drainage area of this pond is extremely small, consisting only of a small hill and the immediate area surrounding the pond. The pond area is fenced and, in the past, this small pasture was used to trap cattle. Located in a hillside above the Alder Creek drainage, Walnut Spring and pond's small drainage is not subject to flooding and has a drainage area of less than 0.5 acre. The pond is at an elevation of 3,670 feet. Brooks (1985) classified its habitat type as a tank/pond with no cover and a silt bottom. Riparian vegetation present at Walnut Spring includes Arizona walnut (*Juglans major*), grape (*Vitis arizonica*), mesquite, hackberry, and ash (*Fraxinus velutina*). Lowland leopard frogs (*Rana yavapaiensis*) and mud turtles (*Kinosternon* sp.) are also present. Vegetation downstream of the spring is extremely dense (U.S. Fish and Wildlife Service 1995).

The pond was originally constructed to provide water for grazing livestock on the Cross F allotment. That use continues today. In 1982, Gila topminnow (*Poeciliopsis occidentalis*) were stocked into the pond as part of an effort to increase the range of the species and contribute to its recovery (U.S.Fish and Wildlife Service 1982; Brooks 1986). The pond has supported a very large population of topminnow since stocking (Weedman and Young 1997). Gila topminnow may also be found for a short distance downstream of the pond, although their presence in this area is ephemeral and dependent on augmentation from fish in the pond.

Comparison of current conditions with photos taken in 1982 indicates that the water level in the pond has dropped between 0.5 and 1.0 foot. Monitoring reports have noted that the pond appeared to be slowly filling as a result of debris and dust falling into it (Voeltz and Bettaso 2003). Recent observations have also found that the outflow berm of the pond has eroded down, thus dropping the water level. Because of the arrangement of the fencelines surrounding Walnut Spring, livestock cross over the berm to pass from Alder pasture into the holding pasture. There is no indication that discharge from the spring has decreased. Currently, dimensions of surface water at the pond are about 27 feet by 37 feet, and water depth is about 6 inches to the top of a silt layer. Total depth to solid bottom is about two feet. The depth of the pond in 1982 was recorded as 16 inches. The decrease in depth is likely due to siltation from cattle use, and from a decrease in the height of the berm that serves as a dam to form the pond due to cattle use from walking on the berm.

With the decrease in water level there is a concern that severe winter conditions could freeze the pond and eliminate the topminnow population there, or continued erosion of the outflow could result in complete loss of surface water. Current livestock grazing eliminates all emergent and submerged vegetation at the pond, thus limiting cover that could be used by topminnow during

adverse conditions. Additionally, cattle impact on the berm will continue to erode the outflow channel and further decrease the water level in the pond.

Below the berm, the hillside slopes steeply down into Alder Creek. Water from the spring and pond flows over the berm and down a steep, boulder-strewn reach. Gila topminnow (and in the future, desert pupfish) will inevitably move down into this area and into Alder Creek. However, because this portion of Alder Creek is ephemeral, neither species is expected to persist downstream of the pond.

A. Status of the species within the action area

One thousand Gila topminnow were stocked into Walnut Spring on June 4, 1982. The population was surveyed at least once every three years since stocking. Exact counts of topminnows are meaningless due to the high and rapid reproductive capability of the species, and no counts have ever been attempted at Walnut Spring. Ocular observations suggest the population there has an extremely high density of individuals per surface area when compared with other sites in southwest Arizona. During the summer there can be several thousands of topminnow in the pond. Brooks (1985) estimated 5,000 individuals one year after stocking. Gila topminnow is the only fish ever recorded at Walnut Spring.

B. Factors affecting species' environment within the action area

Actions within the project area that affect Gila topminnow are limited to livestock grazing and recreation. Livestock grazing has been ongoing in the action area for years. Livestock use near the spring is indicated by sparse herbaceous plant material and reduced regeneration of woody riparian vegetation within the fenced area. The shore of the pond is highly compacted, with old cattle fecal material present. These impacts affect the topminnow habitat by contributing to the eventual silting in of the pond, and by continually adding fecal material to this small spring. Livestock feeding on the aquatic macrophytes surrounding the pond has eliminated all vegetation at times.

Utilization levels have showed a dramatic decrease since this allotment was subject to improved management under a rest-rotation schedule that produced more even utilization and more forage production. Reduced livestock numbers are also a factor. In the early 1970s and again in the early 1980s, utilization levels were high over much of the allotment, particularly near permanent waters. Since the implementation of improved management, however, utilization levels have been dropping.

Recreation impacts are increasing on the District and on the allotment, especially in meadow and riparian areas. Walnut Spring occurs along Forest Route 393, a 4-wheel drive road, and is a relatively short distance from the Bee Line Highway (3.5 miles), the spring itself is subject to little, if any, recreational use. Hunting, off-highway vehicle use, camping, hiking, and sightseeing occur in the area, though accessibility is somewhat limited by rugged terrain. With increasing recreation, Walnut Spring and its associated pond may see some increase in recreational use, although given its remote location and its small size, these effects will likely be insignificant.

EFFECTS OF THE ACTION

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

Grazing

The main impacts from cattle are the grazing of plants and trampling of vegetation and soil (Marlow and Pogacnik 1985). These impacts can affect both riparian zones and uplands. In addition, cattle can affect water quality (Armour et al. 1991).

Due to the small drainage area above Walnut Springs pond, grazing outside the spring fence will have little impact on the pond. Also, because cattle will be present for only a short time, the potentially detrimental effect of livestock waste on fish (Cross 1971, Taylor et al. 1991) is not expected to present a serious threat; this is also lessened by the fact that wetlands are noted for their ability to remove pollutants (Johnston et al. 1990). This is also supported by the fact that the topminnow population has flourished at Walnut Spring in the presence of cattle grazing for over 20 years. However, if a large number of cattle were allowed access to the pond, it is conceivable that cattle could consume enough water to eliminate the pond, or deteriorate water quality to the detriment of topminnow.

Livestock grazing likely has effects to individual topminnow and pupfish, and it affects the viability of topminnow and pupfish populations through siltation and possible failure of the berm that impounds the spring. However, as previously mentioned, the topminnow population has thrived in the presence of livestock at this site for 22 years. With proposed maintenance of the pond, this topminnow population, and any pupfish population established, should continue to persist into the foreseeable future in the presence of continued livestock grazing under existing management. Note that proposed maintenance of the pond may include fencing to exclude cattle in the future. However, livestock use at some level should be maintained to prevent the pond from become overgrown with vegetation.

Maintenance

Pond maintenance may include dredging to remove silt, building up the berm with gravel and soil, and piping to create an off-site drinker with a safety valve to prevent accidental draining of the pond. During these activities, some individuals may be killed by trampling, being accidentally dropped, or by handling stress. The salvage and holding activities will be a State action and this take is already covered under AGFD's existing 10(a)(1)(A) permit and will be reported by AGFD in their annual reports. Although piping and creating a drinker would create the risk of draining the pond, potentially killing all or most of the topminnow and pupfish

population, the safety valve is expected to prevent this. Road maintenance and fence maintenance should not affect either fish species.

Recreation

As mentioned above, recreation is not expected to have a significant effect on either topminnow or pupfish. Forest Route 393 is a rough four-wheel drive road. Although the road is likely traveled fairly frequently by off-road enthusiasts and other recreators, the size of the pond and the fact that it is somewhat hidden from the road likely reduces the chances of anyone utilizing the pond or vandalizing it. Likewise, due to its small size, it is very unlikely that someone would use the pond for recreational fishing or attempt to illegally introduce bait fish or game fish, although the possibility does exist.

Monitoring

Monitoring of forage utilization, bank alteration, pond condition and berm condition by Tonto NF is not expected to affect either fish species. Monitoring of the fish species will be conducted by AGFD under the Department's 10(a)(1)(A) permit.

Translocation

Translocation of pupfish from a source population to Walnut Spring will be conducted by AGFD under the department's 10(a)(1)(A) permit.

CUMULATIVE EFFECTS

Cumulative effects include those of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions are subject to the consultation requirements established under section 7, and therefore are not considered cumulative in the proposed action. Because the action area is entirely within Forest Service lands, any future actions should be subject to Section 7 consultation.

CONCLUSION

After reviewing the status of the Gila topminnow and desert pupfish, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the proposed action, as proposed, is not likely to jeopardize the continued existence of these species and ultimately, the project should benefit both species. The conclusions of this biological opinion are based on full implementation of the project as described in the Description of the Proposed Action section of this document, including any Conservation Measures that were incorporated into the project design.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations 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 measures described below are non-discretionary, and must be undertaken by the Forest Service so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Forest Service has a continuing duty to regulate the activity covered by this incidental take statement. If the Forest Service (1) fails to assume and implement the terms and conditions or (2) fails to require the permittee to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Forest Service must report the progress of the action and its impact on the species to the FWS as specified in the incidental take statement [50 CFR '402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

Of all the actions possibly occurring in the action area, we only anticipate take occurring from grazing, maintenance of the pond, and from use of a drinker if installed in the future. We anticipate that there is a likelihood that livestock grazing could result in incidental take in the form of harm, death, or injury of Gila topminnow and desert pupfish. Take would be primarily in the form of injury to the species through trampling, physiological effects of reduced water quality, or loss of habitat through sedimentation or dewatering. Livestock will continue to have access to Walnut Spring, so it is possible that Gila topminnow and desert pupfish will be injured or killed due to trampling or adverse changes in water quality, or loss of habitat by dewatering. Also, Gila topminnow and desert pupfish could be injured or killed by entrainment into the livestock drinker if one is constructed in the future. We anticipate that any take of Gila topminnow or desert pupfish would be difficult to detect and quantify because they have a small body size and they are highly fecund; thus, rapid reproduction of the species may mask any population decline resulting from the take. Therefore, it is not possible to provide precise numbers of Gila topminnow and desert pupfish that could be harmed, injured, or killed from the proposed action. In such instances where take is otherwise difficult to detect and/or quantify, we

may quantify take in terms of some aspect of the species' habitat that may be diminished or removed by the action. Therefore we will consider authorized take to have been exceeded if the pond depth is reduced to six inches or less, and this decline is due to cattle grazing or maintenance activities.

Maintenance of the pond also may cause take of Gila topminnow and desert pupfish. Take resulting from people tramping in the pond, from accidentally dropping fish out of the water, and from the resulting stress of being captured and handled will be covered under the AGFD 10(a)(1)(A) permit, and such take is not considered as part of this consultation.

EFFECT OF THE TAKE

In this biological opinion, we determined that this level of anticipated take is not likely to result in jeopardy to the Gila topminnow or desert pupfish. This is due primarily to the fact that the project's main purpose is to improve habitat for native fish and establish a new population of desert pupfish, and adverse effects will be short-lived.

REASONABLE AND PRUDENT MEASURES WITH TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, the Forest Service must comply with the following terms and conditions, which implement the associated reasonable and prudent measures and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

The following reasonable and prudent measures and terms and conditions are necessary and appropriate to minimize the effects of take of Gila topminnow and desert pupfish.

1. Conduct all proposed actions in a manner that will minimize take of Gila topminnow and desert pupfish.

    a. The fence surrounding Walnut Spring and pond shall be inspected and maintained before any livestock gathering occurs in Alder Creek pasture.

    b. If, in the future, a water trough/drinker is installed, the design must include a screen filter at the intake to prevent the entrainment of topminnow or pupfish, as well as a safety valve to prevent the accidental draining of the pond.

2. Monitor the fish community and habitat to document levels of incidental take and to check for the release of nonnative fish at Walnut Springs.

    a. The Tonto NF shall coordinate with AGFD to insure that Walnut Spring and pond are monitored annually.

    b. Tonto NF will coordinate with AGFD to provide an annual report that will include presence/absence of topminnow and pupfish, a visual estimate of fish numbers, a description of berm condition, measurements of pond water depth and

surface area, and a quantitative estimate of pond volume. These data will also be collected before and just after maintenance to determine the baseline condition for comparison in subsequent surveys.

3. Maintain and report records of fish populations and riparian and aquatic habitat monitoring at Walnut Spring.

   a. Maintain complete and accurate records of fish population status and habitat monitoring of Walnut Spring, pond, and stream.

   b. Copies of the records required in 3.1.a. above shall be provided annually to the AESO by September 1.

Disposition of Dead or Injured Listed Species

Upon locating a dead, injured, or sick listed species initial notification must be made to the FWS's Law Enforcement Office, 2450 W. Broadway Rd, Suite 113, Mesa, Arizona, 85202, telephone: 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 if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible condition. All fish mortalities should be fixed in formalin, preserved in ethanol, and deposited at Arizona State University vertebrate museum or other appropriate museum.

CONSERVATION RECOMMENDATIONS

Sections 2(c) and 7(a)(1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendations provided here do not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a)(1) responsibility for the desert pupfish or Gila topminnow. In furtherance of the purposes of the Act, we recommend implementing the following discretionary actions:

We recommend the following:

1. Assist in the implementation of a recovery tasks outlined in the desert pupfish and Gila topminnow recovery plans.

2. Coordinate with us and the AGFD to reestablish desert pupfish and Gila topminnow throughout appropriate habitat on the Tonto NF.

3. Coordinate with us and AGFD to begin an aggressive program to control nonnative aquatic species on Tonto NF in areas identified as native fish management areas.

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

REINITIATION NOTICE

This concludes formal consultation on the action outlined in your 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.

The FWS appreciates the Forest Service's efforts to identify and minimize effects to listed species from this project. For further information please contact Glen Knowles (x233) or Debra Bills (x239). Please refer to the consultation number, 02-21-95-F-0303-R1, in future correspondence concerning this project.

Sincerely,

/s/ Steven L. Spangle
Field Supervisor

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
District Ranger, Mesa Ranger District, Tonto National Forest, Payson, AZ
Assistant Field Supervisor, Tucson, AZ (Attn: Doug Duncan)

Nongame Branch, Arizona Game and Fish Department, Phoenix, AZ
[permittees]

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Figure 1. Map of Walnut Spring, illustrating proximity to Alder Creek (Verde River drainage), Forest Route 393, and Highway 87.

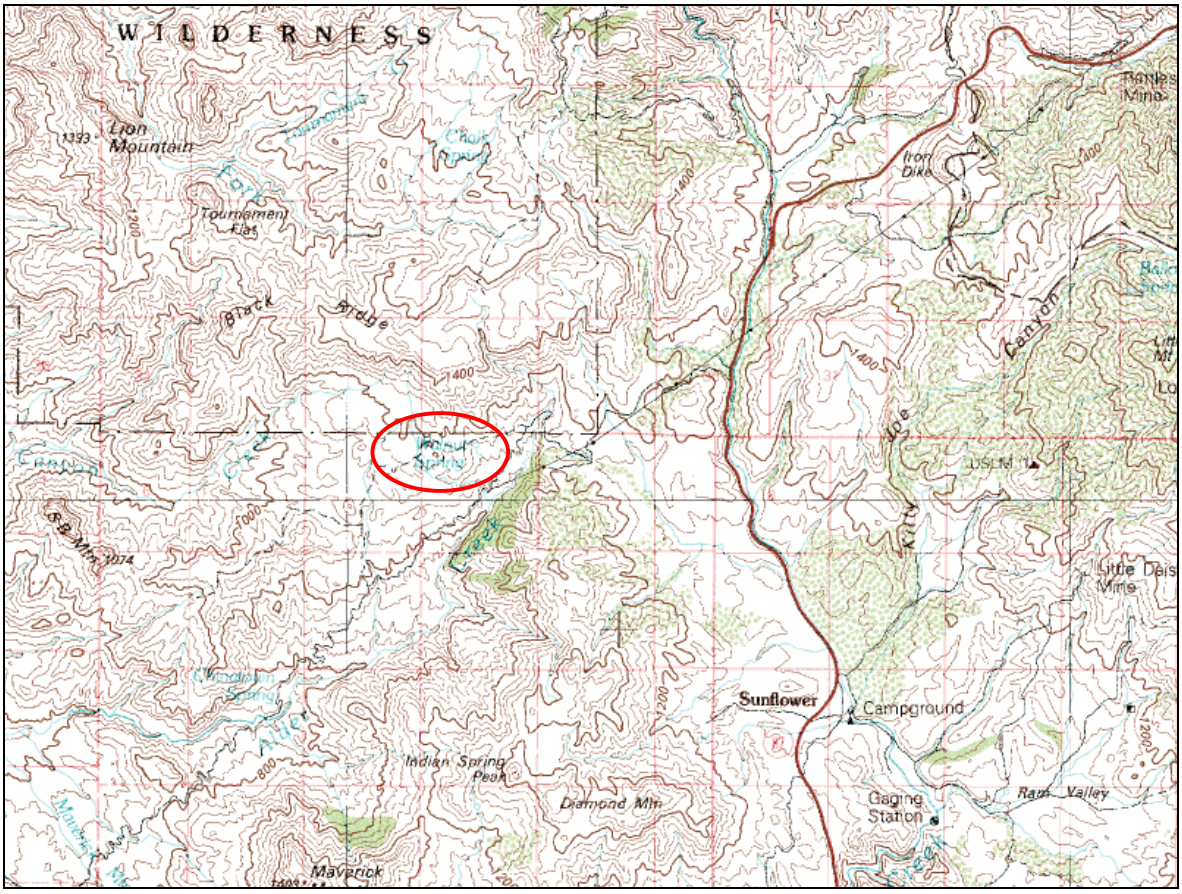

Figure 2. Diagram of Walnut Spring.