United States Department of the Interior

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In Reply Refer To:
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October 27, 2010

Memorandum

To: Chief, Division of Wildlife and Sport Fisheries Restoration, U.S. Fish and Wildlife Service, Albuquerque, New Mexico (Attn: Steve Robertson)

From: Field Supervisor

Subject: Reinitiated Biological Opinion on Stocking of Trout at Peña Blanca Lake, Santa Cruz County, Arizona

Thank you for your request of October 15, received by us on October 19, 2010, for formal intra-service consultation with the Arizona Ecological Services Office (AESO) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). At issue are impacts that may result from stocking of rainbow trout (*Oncorhynchus mykiss*) into Peña Blanca Lake, Santa Cruz County, Arizona from November, 2010 through March, 2011. The proposed action may affect the Chiricahua leopard frog (*Lithobates chiricahuensis*), a threatened species.

This biological opinion is based on the project proposal, literature, telephone conversations, field investigations, and other sources of information. Literature cited in this biological opinion is not a complete bibliography of all literature available on the Chiricahua leopard frog, stocking of sport fishes into the frog's habitat or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

Consultation History

<u>March 5, 2010</u>: Lesley Fitzpatrick of the AESO in Phoenix contacted Jim Rorabaugh in the AESO Tucson Office to inform him of a March 23, 2010, planned stocking of Peña Blanca Lake with rainbow trout, which would be funded in part by the Division of Wildlife and Sport Fisheries Restoration (WSFR). Formal consultation was deemed necessary because of the likelihood of incidental take of Chiricahua leopard frog.

<u>March 9, 2010</u>: The decision was made by Steven Spangle to expedite formal consultation of the proposed trout stocking project.

<u>March 11, 2010</u>: AESO received the request to initiate formal consultation from WSFR.

August 19, 2010: Arizona Game and Fish Department (AGFD) provided a list of stocking sites to AESO and WSFR to be included in a continuation of the sportfish stocking program from November 1, 2010 through February 28, 2011. This list included rainbow trout stocking at Peña Blanca Lake over that time period.

September 2, 2010: AGFD provided AESO and WSFR with a final list of stocking sites with an amended period for coverage of November 1, 2010 to March 31, 2011. Because the March 16, 2010, Peña Blanca rainbow trout biological opinion only covered stocking actions in March, 2010, reinitiation of formal consultation to address effects of stockings from November, 2010, through March, 2011 was identified as necessary.

October 19, 2010: WSFR requested reinitiation of formal consultation on the stocking of rainbow trout at Peña Blanca Lake.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

WSFR proposes to provide Sport Fish Restoration funding under the FW-100-P-17 Fish and Wildlife Management Coordination and Planning grant to AGFD for stocking of a total of 45,000, 10-12 inch rainbow trout into Peña Blanca Lake in six stocking events from November, 2010 through March, 2011. For each event, fish would be loaded into a tanker truck at Page Springs Fish Hatchery near Sedona in Coconino County and trucked to Peña Blanca Lake where the trout would be offloaded into the Lake.

Conservation Measures

1) AGFD proposes to implement their Hazard Analysis and Critical Control Point (HACCP) process to minimize the likelihood of transporting non-target organisms with the trout from Page Springs Hatchery (Gurkin undated). The five steps in the HACCP planning process are:

- Describe the activity
- Identify the potential hazards
- Diagram the flow of steps for the activity
- Fill out a hazard analysis worksheet
- Complete the HACCP plan form

AGFD maintains that the likelihood of transferring non-target organisms with the trout is very low due to the following conditions and protocols at Page Springs, which they propose as part of this action:

1) The water source is a combination of a secured spring (Pond Spring) and a semi-exposed spring (Cave Spring) all with underground pipes, minimizing the chance of non-target organisms entering with the water.

2) No mollusks or vegetation are present in the spring water sources or in the raceways where the trout are raised.

3) The fish are moved directly from the raceways to the trucks.

Status of the Species

CHIRICAHUA LEOPARD FROG

The Chiricahua leopard frog (*Lithobates chiricahuensis*) was listed as a threatened species without critical habitat in a Federal Register notice dated June 13, 2002. Included was a special rule to exempt operation and maintenance of livestock tanks on non-Federal lands from the section 9 take prohibitions of the Act. The frog is distinguished from other members of the *Lithobates pipiens* complex by a combination of characters, including a distinctive pattern on the rear of the thigh consisting of small, raised, cream-colored spots or tubercles on a dark background; dorsolateral folds that are interrupted and deflected medially; stocky body proportions; relatively rough skin on the back and sides; and often green coloration on the head and back (Platz and Mecham 1979). The species also has a distinctive call consisting of a relatively long snore of 1 to 2 seconds in duration (Platz and Mecham 1979, Davidson 1996). Snout-vent lengths of adults range from approximately 2.1 to 5.4 inches (Platz and Mecham 1979, Stebbins 2003). The Ramsey Canyon leopard frog (*Lithobates* "*subaquavocalis*"), found on the eastern slopes of the Huachuca Mountains, Cochise County, Arizona, has recently been subsumed into *Lithobates chiricahuensis* (Crother 2008) and recognized by the Fish and Wildlife Service (FWS) as part of the listed entity (U.S. Fish and Wildlife Service 2009).

The range of the Chiricahua leopard frog includes central and southeastern Arizona; west-central and southwestern New Mexico; and, in Mexico, northeastern Sonora, the Sierra Madre Occidental of northwestern and west-central Chihuahua, and possibly as far south as northern Durango (Platz and Mecham 1984, Degenhardt et al. 1996, Lemos-Espinal and Smith 2007, Rorabaugh 2008). Reports of the species from the State of Aguascalientes (Diaz and Diaz 1997) are questionable. The distribution of the species in Mexico is unclear due to limited survey work and the presence of closely related taxa (especially *Lithobates lemosespinali*) in the southern part of the range of the Chiricahua leopard frog. Historically, the frog was an inhabitant of a wide variety of aquatic habitats, including cienegas, pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 3,281 to 8,890 feet. However, the species is now limited primarily to headwater streams, springs and cienegas, and cattle tanks into which non-native predators (e.g. sport fishes, American bullfrogs, crayfish, and tiger salamanders) have not yet invaded or where their numbers are low (U.S. Fish and Wildlife Service 2007). The large valley-bottom cienegas, rivers, and lakes where the species occurred historically are populated with non-native predators at densities with which the species cannot coexist.

The primary threats to this species are predation by non-native organisms and die offs caused by a fungal skin disease – chytridiomycosis. Additional threats include drought; floods; degradation and loss of habitat as a result of water diversions and groundwater pumping; poor livestock management; altered fire regimes due to fire suppression and livestock grazing; mining, development, and other human activities; disruption of metapopulation dynamics; increased chance of extirpation or extinction resulting from small numbers of populations and individuals; and environmental contamination (U.S. Fish and Wildlife Service 2007). Loss of Chiricahua leopard frog populations is part of a pattern of global amphibian decline, suggesting other regional or global causes of decline may be important as well (Carey et al. 2001). Witte et al. (2008) analyzed risk factors associated with disappearances of ranid frogs in Arizona and found that population loss was more common at higher elevations and in areas where other ranid population disappearances occurred. Disappearances were also more likely where introduced crayfish occur, but were less likely in areas close to a source population of frogs.

Based on 2009 data, the species is still extant in the major drainage basins in Arizona and New Mexico where it occurred historically; with the exception of the Little Colorado River drainage in Arizona and possibly the Yaqui drainage in New Mexico. It has not been found recently in many rivers within those major drainage basins, valleys, and mountains ranges, including the following in Arizona: White River, West Clear Creek, Tonto Creek, Verde River mainstem, San Francisco River, San Carlos River, upper San Pedro River mainstem, Santa Cruz River mainstem, Aravaipa Creek, Babocomari River mainstem, and Sonoita Creek mainstem. In southeastern Arizona, no recent records (1995 to the present) exist for the Pinaleño Mountains or Sulphur Springs Valley; and the species is now apparently extirpated from the Chiricahua Mountains. Moreover, the species is now absent from all but one of the southeastern Arizona valley bottom cienega complexes. In many of these regions Chiricahua leopard frogs were not found for a decade or more despite repeated surveys. As of 2009, there were 84 sites in Arizona at which Chiricahua leopard frogs occur or are likely to occur in the wild, with an additional four captive or partially captive refugia sites. At least 33 of the wild sites support breeding. In New Mexico, 15-23 breeding sites were known in 2008; the frogs occur at additional dispersal sites. The species has been extirpated from about 80 percent of its historical localities in Arizona and New Mexico. Nineteen and eight localities are known from Sonora and Chihuahua, respectively. The species' current status in Mexico is poorly understood; however, it has been found in recent years in western Chihuahua. Some threats, such as introduced non-native predators and the threat of catastrophic wildfire, appear to be less important south of the border, particularly in the mountains where Chiricahua leopard frogs have been found (Gingrich 2003, Rosen and Melendez 2006, Rorabaugh 2008).

The chytridiomycete skin fungus, *Batrachochytrium dendrobatidis* (*Bd*), the organism that causes chytridiomycosis, is responsible for global declines of frogs, toads, and salamanders (Berger et al. 1998, Longcore et al. 1999, Speare and Berger 2000, Hale 2001). Decline or extinction of about 200 amphibian species worldwide has been linked to the disease (Skerratt et al. 2007). In Arizona, *Bd* infections have been reported from numerous populations of Chiricahua leopard frogs in southeastern Arizona and one population on the Tonto National Forest, as well as populations of several other frogs and toads in Arizona (Morell 1999, Davidson et al. 2000, Sredl and Caldwell 2000, Hale 2001, Bradley et al. 2002, U.S. Fish and Wildlife Service 2007). In New Mexico, chytridiomycosis appears to be widespread in populations in west-central New Mexico, where it often leads to population extirpation. A threats assessment conducted for the species during the development of the recovery plan identified *Bd* as the most important threat to the frog in recovery units 7 and 8 in New Mexico. In recovery unit 6, which includes much of the mountainous region of west-central New Mexico, *Bd* and non-native predators were together identified as the most important threats. Die-offs typically occur during the cooler months from October-February (U.S. Fish and Wildlife Service 2007).

The role of the fungi in the population dynamics of the Chiricahua leopard frog is as yet undefined. Some populations are driven to extinction soon after the animals become symptomatic; however, other Chiricahua leopard frog populations can exist with the disease for years (U.S. Fish and Wildlife Service 2007). For instance, the frog has coexisted with *Bd* in Sycamore Canyon, Santa Cruz County, Arizona since at least 1972. That is the earliest record for *Bd* in the western United States, which roughly corresponds to the first observed mass die-offs of ranid frogs in Arizona. Even in cases where populations exist with the disease, it is an additional stressor, resulting in periodic die-offs that increase the likelihood of extirpation and extinction.

Epizootiological data from Central America and Australia (high mortality rates, wave-like spread of declines, wide host range) suggest introduction of the disease into previously uninfected populations and the disease subsequently becoming enzootic in some areas. Alternatively, the fungus may be a widespread organism that has emerged as a pathogen because of either higher virulence or an increased host susceptibility caused by other factors such as environmental changes (Berger et al. 1998), including changes in climate or microclimate, contaminant loads, increased UV-B radiation, or other factors that cause stress (Pounds and Crump 1994; Carey et al. 1999, 2001; Daszak 2000). Morehouse et al. (2003) found low genetic variability among 35 *Bd* strains from North America, Africa, and Australia, suggesting that the first hypothesis – that it is a recently emerged pathogen that has dispersed widely – is the correct hypothesis. Retrospective analysis revealed presence of chytridiomycosis in wild African clawed frogs (*Xenopus laevis*) dating to 1938 (Weldon et al. 2004). African clawed frogs were exported to many areas of the globe from Africa for use in human pregnancy testing beginning in the 1930s. Some of the test frogs escaped or were released and established populations in California, Arizona, and other areas. Although other explanations for the origin of the disease are viable, Weldon et al. (2004) suggest that Africa is where the disease originated and that international trade in African clawed frogs was the means of disease dissemination.

If the disease was introduced to the Southwest via escaped or released clawed frogs, it may have spread across the landscape by human introductions or natural movements of secondarily-infected American bullfrogs, tiger salamanders, or leopard frogs. If this is the case, its rapid establishment and spread could be attributable to humans. *Bd* does not have an airborne spore, so it must spread via other means. Amphibians in the international pet trade (Europe and USA), outdoor pond supplies (USA), zoo trade (Europe and USA), laboratory supply houses (USA), and species recently introduced (*Rhinella marinus* in Australia and American bullfrog in the USA and Uruguay) have been found infected with *Bd*, suggesting human-induced spread of the disease (Daszak 2000, Mazzoni et al. 2003).

Free-ranging healthy bullfrogs with low-level *Bd* infections have been found in southern Arizona (Bradley et al. 2002). Tiger salamanders and bullfrogs can carry the disease without exhibiting clinically significant or lethal infections. When these animals move, or are moved by people, among aquatic sites, *Bd* may be carried with them (Collins et al. 2003, Picco and Collins 2008). Other native or non-native frogs may serve as disease vectors or reservoirs of infection, as well (Bradley et al. 2002). Green and Dodd (2007) found *Bd* in bullfrogs at a fish hatchery in Georgia and suggested the disease could be moved with stocks of fish. Since that study, *Bd* was confirmed from a bullfrog captured at the Bubbling Ponds Hatchery in Arizona (V. Boyarski, pers. comm.). *Bd* could also be spread by tourists or fieldworkers sampling aquatic habitats (Halliday 1998). The fungus can exist in water or mud and thus could be spread by wet or muddy boots, vehicles, cattle, fishing gear, and other animals moving among aquatic sites, or during scientific sampling of fish, amphibians, or other aquatic organisms. The FWS and AGFD are employing preventative measures to ensure the disease is not spread by aquatic sampling.

Numerous studies indicate that declines and extirpations of Chiricahua leopard frogs are at least in part caused by predation and possibly competition by non-native organisms, including fishes in the family Centrarchidae (*Micropterus* spp., *Lepomis* spp.), bullfrogs (*Lithobates catesbeianus*), tiger salamanders (*Ambystoma mavortium mavortium*), crayfish (*Orconectes virilis* and possibly others), and several other species of fishes (Clarkson and Rorabaugh 1989; Sredl and Howland 1994; Fernandez and Bagnara 1995; Rosen et al. 1996, 1994; Snyder et al. 1996; Fernandez and Rosen 1996, 1998). For instance, in the Chiricahua region of southeastern Arizona, Rosen et al. (1996) found that almost all perennial waters investigated that lacked introduced predatory vertebrates supported Chiricahua leopard frogs. All waters except three that supported introduced vertebrate predators lacked Chiricahua leopard frogs. Sredl and Howland (1994) noted that Chiricahua leopard frogs were nearly always absent from sites supporting bullfrogs and non-native predatory fish. Rosen et al. (1996) suggested further study was needed to evaluate the effects of mosquitofish, trout, and catfish on frog presence.

Waters at the Beatty's Guest Ranch in the Huachuca Mountains supports one of the most robust and dense populations of Chiricahua leopard frogs. Mosquitofish occupy all the waters at the Ranch, suggesting predation by mosquitofish may be insignificant; however, the coexistence of these species could be influenced by other factors, such as abundant escape cover, high adult frog survivorship, and high reproductive output in terms of numbers of frog egg masses produced. Examination of studies with other ranid frog species illustrates the likely effects of trout on Chiricahua leopard frogs. The relationship between trout and amphibian decline has best been documented with the Mountain yellow-legged frog (*Rana muscosa*) in high lakes of the Sierra Nevada, California. Several authors have concluded that predation by introduced trout and charr (*Salveninus* spp.) into these previously fishless lakes have eliminated many populations of this species (Bradford 1989, Bradford et al. 1993, Knapp and Mathews 2000, Vredenburg et al. 2005). One of the threats that lead to the listing of the southern California populations of the Mountain yellow-legged frog was predation by introduced trout. However, other factors, including chytridiomycosis and pesticides, are possible contributors to the decline of the species as well (Fellers et al. 2001, 2004; Vredenburg et al. 2005). Predation by trout has also been also implicated as a factor in decline or population loss in the Cascades frog (*Rana cascadae*, Fellers et al. 2007) and Columbia spotted frog (*Rana luteiventris*, Reaser and Pilliod 2005).

Disruption of metapopulation dynamics is likely an important factor in regional loss of populations (Sredl and Howland 1994, Sredl et al. 1997). Chiricahua leopard frog populations are often small and habitats are dynamic, resulting in a relatively low probability of long-term population persistence. Historically, populations were more numerous and closer together. If populations winked out due to drought, disease, or other causes, extirpated sites could be recolonized via immigration from nearby populations. However, as numbers of populations declined, populations became more isolated and were less likely to be recolonized if extirpation occurred. Also, most of the larger source populations along major rivers and in cienega complexes have disappeared.

Fire frequency and intensity in Southwestern forests are much altered from historical conditions (Dahms and Geils 1997). Before 1900, surface fires generally occurred at least once per decade in montane forests with a pine component. Beginning about 1870-1900, these frequent ground fires ceased to occur due to intensive livestock grazing that removed fine fuels, followed by effective fire suppression in the mid to late 20th century (Swetnam and Baisan 1996). Absence of ground fires allowed a buildup of woody fuels that precipitated infrequent but intense crown fires (Swetnam and Baisan 1996, Danzer et al. 1997). Absence of vegetation and forest litter following intense crown fires exposes soils to surface and rill erosion during storms, often causing high peak flows, sedimentation, and erosion in downstream drainages (DeBano and Neary 1996). These post-fire events have likely resulted in scouring or sedimentation of frog habitats (Wallace 2003).

An understanding of the dispersal abilities of Chiricahua leopard frogs is key to determining the likelihood that suitable habitats will be colonized from a nearby extant population of frogs. As a group, leopard frogs are surprisingly good at dispersal. In Michigan, young northern leopard frogs (*Lithobates pipiens*) commonly move up to 0.5 mile from their place of metamorphosis, and three young males established residency up to 8.4 miles from their place of metamorphosis (Dole 1971). Both adults and juveniles wander widely during wet weather (Dole 1971). In the Cypress Hills, southern Alberta, young-of-the year northern leopard frogs successfully dispersed to downstream ponds 3.4 miles from the source pond, upstream 0.6 mile, and overland 0.6 mile. At Cypress Hills, a young-of-the-year northern leopard frog moved 5 miles in one year (Seburn et al. 1997). The Rio Grande leopard frog (*Lithobates berlandieri*) in southwestern Arizona has been observed to disperse at least one mile from any known water source during the summer rainy season (Rorabaugh 2005). After the first rains in the Yucatan Peninsula, leopard frogs have been collected a few miles from water (Campbell 1998). In New Mexico, Jennings (1987) noted collections of Rio Grande leopard frogs from intermittent water sources and suggested these were frogs that had dispersed from permanent water during wet periods.

Dispersal of leopard frogs away from water in the arid Southwest may occur less commonly than in mesic environments in Alberta, Michigan, or the Yucatan Peninsula during the wet season.

However, there is evidence of substantial movements even in Arizona. Movement may occur via locomotion of frogs or passive movement of tadpoles along streamcourses. The maximum distance moved by a radio-telemetered Chiricahua leopard frog in New Mexico was 2.2 miles in one direction (R. Jennings, C. Painter, pers. comm. 2004). In 1974, Frost and Bagnara (1977) noted passive or active movement of Chiricahua and Plains (*Lithobates blairi*) leopard frogs for 5 miles or more along East Turkey Creek in the Chiricahua Mountains. In August, 1996, Rosen and Schwalbe (1998) found up to 25 young adult and subadult Chiricahua leopard frogs at a roadside puddle in the San Bernardino Valley, Arizona. They believed that the only possible origin of these frogs was a stock tank located 3.4 miles away. Rosen et al. (1996) found small numbers of Chiricahua leopard frogs at two locations in Arizona that supported large populations of non-native predators. The authors suggested these frogs could not have originated at these locations because successful reproduction would have been precluded by predation. They found that the likely source of these animals were populations 1.2-4.3 miles distant. In September 2009, 15-20 Chiricahua leopard frogs were found at Peña Blanca Lake west of Nogales. The nearest likely source population is Summit Tank, a straight line distance of 3.1 miles overland and approximately 4.1 miles along intermittent drainages.

Movements away from water do not appear to be random. Streams are important dispersal corridors for young northern leopard frogs (Seburn et al. 1997). Displaced northern leopard frogs will home, and apparently use olfactory and auditory cues, and possibly celestial orientation, as guides (Dole 1968, 1972). Rainfall or humidity may be an important factor in dispersal because odors carry well in moist air, making it easier for frogs to find other wetland sites (Sinsch 1991). Based on these studies, the Chiricahua leopard frog recovery plan (U.S. Fish and Wildlife Service 2007) provides a general rule on dispersal capabilities. Chiricahua leopard frogs are assumed to be able to disperse one mile overland, three miles along ephemeral drainages, and five miles along perennial water courses.

A recovery plan has been completed (U.S. Fish and Wildlife Service 2007), the goal of which is to improve the status of the species to the point that it no longer needs the protection of the Endangered Species Act. The recovery strategy calls for reducing threats to existing populations; maintaining, restoring, and creating habitat that will be managed in the long term; translocating frogs to establish, reestablish, or augment populations; building support for the recovery effort through outreach and education; monitoring; conducting research needed to provide effective conservation and recovery; and application of research and monitoring through adaptive management. Recovery actions are recommended in each of eight recovery units throughout the range of the species. Management areas are also identified within recovery units where the potential for successful recovery actions is greatest.

Additional information about the Chiricahua leopard frog can be found in Platz and Mecham (1984, 1979), Sredl and Howland (1994), Jennings (1995), Rosen et al. (1996, 1994), Degenhardt et al. (1996), Sredl et al. (1997), Painter (2000), Sredl and Jennings (2005), and U.S. Fish and Wildlife Service (2007).

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.

Description of the Action Area

The Action Area includes all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. The action area is Peña Blanca Lake and connected reaches of Peña Blanca Canyon. Most of the potential effects will occur in the Lake. However, stocked fish could potentially move downstream or upstream in Peña Blanca Canyon, and frogs within dispersal distance of the lake could move to the Lake and be subject to predation by the stocked trout.

Environmental Setting

Peña Blanca Lake, when full, covers roughly 45 acres in hilly oak-grassland terrain at about 3,800 feet elevation. The dam, which is at the Lake's north end, was built in 1957 by the AGFD and the Lake opened to the public in 1958. The area is popular with bird watchers and hikers. There is a newly renovated boat ramp and fishing pier along with the Peña Blanca Trail - a fairly level path that follows the approximate two mile shoreline. The Lake is situated near a Forest Service-maintained campground and is surrounded by Coronado National Forest lands that support a variety of recreational opportunities.

History of Non-native Species at the Lake

For many years Peña Blanca Lake has been a popular fishing and tourist destination, with largemouth bass, bluegill, redear sunfish, green sunfish, black crappie, channel catfish, and black bullhead catfish populating the lake. These fishes all reproduced in the lake. From November to March of each year, the AGFD would stock rainbow trout, which do not reproduce or survive through the summer months. Angler surveys completed in 2001 estimated angler use days at 21,298 (Arizona Game and Fish Department 2009); however, mercury contamination and decommissioning of the lodge and restaurant reduced visitation. Fathead minnow and threadfin shad were stocked in the lake by AGFD in the early 1990s and late 1950s, respectively, but neither species persisted. AGFD also stocked crayfish (1991-1993) and bullfrogs (1968-1971). No AGFD stockings of bluegill, redear sunfish, or green sunfish occurred (Arizona Game and Fish Department 2009). No populations of these species are known upstream of the lake, so these species were likely stocked by anglers.

Under a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) or 'Superfund' project, Peña Blanca Lake was drained and mercury-contaminated sediment removed in 2009. All fish were thought to have been eliminated during the draining and sediment removal process. In the winter of 2009-2010, the Lake refilled with the winter rains. On February 9, 2010, AGFD stocked about 2000, 10-12 inch rainbow trout into the Lake. The trout originated from the Page Springs Fish Hatchery near Sedona. We had conducted an informal intra-service consultation between Ecological Services and the WSFR concurring with a "not likely to adversely affect" determination regarding a one year proposal to stock rainbow trout into Peña Blanca Lake during the winter of 2009-2010; however, we concurred with that determination before we knew there were Chiricahua leopard frogs in the lake (see discussion below).

American bullfrog tadpoles were stocked in Peña Blanca Lake in 1968 and 1971. Hale and May (1983) reported the first stocking of bullfrogs was on September 27, 1968, when 3000 juvenile frogs were released. However, the first collection of a bullfrog in the region - a 1967 collection (UAZ 21104) from Summit Tank - indicates they were already in the area. Furthermore, three specimens were collected from Peña Blanca Lake in April 1968 (UAZ 30073, 52490, 52491), five months before the first frogs were stocked. Rorabaugh and Hale (2005) suggested that predation by introduced non-native fishes, particularly sunfishes (Centrarchidae) and American bullfrogs, may have contributed to the disappearance of the Tarahumara frog (*Lithobates tarahumarae*) from Peña Blanca Spring and portions of Peña Blanca Canyon. If bullfrogs colonized the area in the late 1960s, this corresponds fairly well with the first detection of chytridiomycosis at Sycamore Canyon in 1972, suggesting bullfrogs may have been the vector that brought the disease to the area.

The Lake was thought to act as a source population of bullfrogs for the region (U.S. Fish and Wildlife Service 2007), creating a seemingly intractable non-native problem for Chiricahua leopard frogs and other native amphibians. But the CERCLA project at the Lake presented an opportunity to potentially eliminate bullfrogs from the Lake and surrounding areas. In 2008-2009, a coalition of public and private entities, lead by AGFD, made a herculean effort to do just that. As of this writing, all or most of the bullfrogs have been eliminated from the Lake and an area within five miles of the Lake.

The current status of crayfish at Peña Blanca Lake is unknown. They were observed before the draining of the lake near the inlet to the lake. But they were not known from Peña Blanca Spring or tanks in the region. Whether they survived the renovations and sediment removal at Peña Blanca Lake is unknown. However, no crayfish have been observed since the lake refilled.

Rainbow trout were stocked into Peña Blanca Lake in February and March, 2010, under the original consultation. The Incidental Take statement in the March 13, 2010, biological opinion included a reasonable and prudent measure as follows:

A. A sign shall be posted in a prominent place at Peña Blanca Lake that will include, at a minimum, the fishing regulations for Peña Blanca Lake, including that use of live bait (excluding salamanders) is illegal, release of any live animals is illegal, and that the only sport fish currently in the Lake is rainbow trout. This sign shall be in place before the first rainbow trout stocking event occurs. The sign must be maintained through the period when trout persist in the Lake.

B. WSFR shall, within 15 days of the erection of the sign described in 1.a., submit to Arizona Ecological Services a brief, written report of the installation of the sign, the text of the sign, and the stocking of the trout.

On March 23, 2010, we approved proposed language for the sign with WSFR; however, we did not get a report of the sign being erected or maintained or that the trout had been stocked. The sign was not present in September, 2010; however, by then the rainbow trout were no longer present in the lake.

Chiricahua Leopard Frogs in and near the Action Area

Chiricahua leopard frogs were first collected in the region in 1953 at Sycamore Canyon (UAZ 19800). In the action area, they have been found at Peña Blanca Spring (2010), Summit Tank (2010), Lookout Tank (2002), North Mesa Tank (2008), South Mesa Tank (2009), Coyote Tank (2009), and Thumb Butte Reservoir (2009). A frog was also photographed at Alamo Spring that appeared to be a Chiricahua leopard frog in 2006. Not all of these sites have permanent water, and locations of frogs at some sites may represent dispersing individuals. Breeding has been confirmed only at Summit Tank, but likely occurs at one or more of the other sites, particularly in wet cycles. These tanks likely form a loose metapopulation, and sites that are extirpated through drying or other factors are likely recolonized from adjacent sites. Lowland leopard frogs (*Lithobates yavapaiensis*) also occur in the action area, and Tarahumara frogs occurred historically in Peña Blanca and Alamo canyons.

The action area lies within recovery unit 1, which supports more occupied sites (32) than any other recovery unit, and the strongest metapopulation in the range of the species, which is at Buenos Aires National Wildlife Refuge. This unit is also closer to recovery in terms numbers of metapopulations and isolated robust populations (see recovery criteria 1) than any other recovery unit.

On September 23, 2009, a biologist for the Nogales Ranger District found 15 Chiricahua leopard frogs in Peña Blanca Lake. On September 29, 2009, seven Chiricahua leopard frogs, one lowland leopard frog, and one possible Chiricahua x lowland leopard frog was observed in the Lake. At that time, herons were patrolling the shoreline and it was thought these frogs might not persist. However, on October 13, 2009, a biologist again reported eight "big fat" Chiricahua leopard frogs, eight lowland leopard frogs, and another 11 frogs she thought were lowland leopard frogs. The latter species had also colonized nearby Peña Blanca Spring and was reproducing there. Tadpoles were subsequently observed in Peña Blanca Lake (Sebesta, pers. comm. 2009), confirming reproduction by either or both lowland and Chiricahua leopard frogs.

No surveys were accomplished during the spring or early summer when the stocked rainbow trout from February and March, 2010, were likely still present. A comprehensive survey was conducted on July 7, 2010, which documented approximately 60 Chiricahua leopard frogs in Peña Blanca Lake, mostly on the western end and at inlets (Akins 2010). On the afternoon of September 30, 2010, staff from AESO visited the southwestern shore of Peña Blanca Lake. At least five Chiricahua leopard frogs were observed, several other leopard frogs could not be identified to species, and several lowland leopard frogs were heard calling. Both Chiricahua and lowland leopard frogs were also observed at nearby Peña Blanca Spring and Rudy Ronquillo pond. We anticipate that at the time of these surveys, tadpoles were likely present in the Lake and there may also have been egg masses; however, most Chiricahua leopard frog reproduction at sites below 5,900 feet elevation is between February and June, with a peak in March-May (U.S. Fish and Wildlife Service 2007). Tadpoles generally undergo metamorphosis between three and nine months of age; however some overwinter as tadpoles. We expect that adult and sub-adult Chiricahua leopard frogs and some overwintering tadpoles will be present in the Lake at the start of the proposed rainbow trout stocking. Chiricahua leopard frogs are also generally inactive from late November into February, which covers most of the stocking period.

Effects of the Action

Rainbow trout feed primarily on emerging and terrestrial insects drifting in the water column, but are also known to take fish (McGinnis 1984, Richard and Soltz 1986), and can be important predators on ranid tadpoles (see review in the Status of the Species). Predation on tadpoles of Mountain yellow-legged frogs can be heavy enough to singly, or in combination with other factors, eliminate the species from high mountain lakes in the Sierra Nevada of California (Bradford 1989, Bradford et al. 1993). Knapp and Mathews (2000) found negative effects of trout introductions at the landscape, watershed, and individual water body spatial scales. In Kings Canyon National Park and the John Muir Wilderness, introduced trout distribution was found to be negatively correlated with the distribution of the frog. At the watershed level, the total percentage of water bodies occupied by fish was a highly significant predictor of occupancy by frogs. At the scale of individual water bodies, in fishless sites, frogs were three times more likely to be present and six times more abundant than in sites with fish. Furthermore, experimental removals of introduced trout have been followed by recovery of mountain yellow-legged frog populations (Knapp and Mathews 2000, Keisecker 2003). Knapp and Mathews (2000) evaluated the likelihood that other factors, such as disease, contaminants, and increasing UV-B radiation might be important factors in the observed declines of Mountain yellow-legged frogs. They concluded that introduced trout was the key factor in those declines, although these other factors might be contributing to declines, as well.

No studies have been conducted on the effects of introduced trout on the Chiricahua leopard frog. However, there is no reason to believe rainbow trout would not feed upon Chiricahua leopard frog tadpoles. Similar to the situation with the Mountain yellow-legged frog, the Chiricahua leopard frog occurred historically at a number of the large lakes in the Mogollon Rim region of east-central Arizona, but no longer occurs at these sites (e.g. Hawley Lake – 1967, Blue Lake – 1984, Horseshoe Lake – 1967, Blue Ridge Reservoir – 1972, Nelson Reservoir – 1971, Rainbow Lake – 1972, Tonto Lake – 1971, Baker lake – 1980, and Luna Lake ~1979; year shown is the last year Chiricahua leopard frogs were found). These lakes all contain introduced trout and in some cases other fishes and the last record of a Chiricahua leopard frog at any of these sites is 1984. This is not definitive proof that trout causes extirpation of Chiricahua leopard frogs, but these observations provide evidence that trout may be a factor in the species' decline.

On the other hand, trout and Chiricahua leopard frogs apparently coexisted for some time at the species' type locality, Herb Martyr in the Chiricahua Mountains. However, the length of time the two persisted, or whether the population of frogs may have been a sink into which individuals immigrated from other populations, is unknown. Field notes of Dr. Richard Zweifel suggest that the frogs disappeared between 1974 and 1992; during the latter visit, Zweifel noted that the pond had largely filled in with gravel, although trout persisted in deeper pools below the dam. Whether predation by trout contributed to the demise of the frog at Herb Martyr is unknown. Chiricahua leopard frogs and other leopard frogs can coexist with introduced predators in complex habitats that provide escape cover for frogs and tadpoles (U.S. Fish and Wildlife Service 2007). The current conditions at Peña Blanca Lake include a significant amount of vegetative cover that creates complex habitat around the perimeter of the Lake.

Stocking of the 45,000 rainbow trout across the five-month season would result in a continuing presence of trout at some level across the stocking season and into spring and early summer when stocked trout could persist before water temperatures become too high. Survival of stocked trout in lakes is generally good over the short term with the intensity of angler use a significant factor in removal of stocked fish after a stocking event.

Given the above analysis, it is likely that stocked rainbow trout in Peña Blanca Lake would prey upon Chiricahua leopard frog tadpoles once overwintering individuals became active and adult Chiricahua leopard frogs begin breeding in late winter or spring. Chiricahua leopard frog egg masses contain from 300-1485 eggs (Sredl and Jennings 2005). The presence of at least 60 frogs in July, 2010, suggests that significant reproduction occurred shortly after the lake refilled. The number of tadpoles present in the summer of 2010 is unknown, but based on the number of adults seen in October, 2009, as many as 10,000 tadpoles could have been hatched. It is likely that additional reproduction occurred in 2010. Mortality is generally high in indirect development amphibians (Zug et al. 2001), so the survivorship to November, 2010, is likely reduced. Most tadpoles likely metamorphosed into froglets, and any overwintering tadpoles may be sufficiently large to escape predation by stocked rainbow trout. Egg masses are usually placed in shallow water in dense vegetative cover, and are less likely to be at risk from rainbow trout predation, although some may occur. The tadpoles that will hatch in the spring of 2011 are at risk of predation by stocked rainbow trout. With the potential for dozens of adult frogs producing young, the number of tadpoles at risk could number in the tens of thousands over the course of the breeding season.

Although predation of tadpoles is expected, it is unlikely that this proposed stocking of 45,000 trout would extirpate the frog from Peña Blanca Lake. Even if the fish ate most or all of the early spring tadpole production, the fish are not expected to survive the summer months and will not reproduce in the lake. The habitat complexity around the shoreline of the Lake also provides considerable cover for young tadpoles, and reduces the risk of predation. Loss of a portion of the spring tadpole numbers could be replaced by subsequent reproduction after the fish are caught or die. The number of trout proposed for stocking under this reinitiation is significantly larger than the spring 2010 stockings, and the potential loss of tadpoles increases with the number of trout stocked. The number of potential tadpoles present is also increased due to the presumed larger number of breeding adult Chiricahua leopard frogs that were found in the lake during 2010.

An absence of Chiricahua leopard frog records from the Lake suggests the mix of non-native fishes, bullfrogs, and crayfish that occurred prior to the CERCLA project and bullfrog control efforts was apparently not only capable of preventing Chiricahua leopard frogs from successfully establishing a population at the lake, but served as a source of bullfrogs for the region. Given that Chiricahua leopard frogs immigrated to Peña Blanca Lake in the fall of 2009, they likely did so in previous years (they were documented at nearby Peña Blanca Spring in 2002 and again in 2010), but were consumed by predators soon after they arrived. It is possible that some very large adult Chiricahua leopard frogs, big enough to avoid predation by most bullfrogs and introduced fish, might have survived for extended periods of time at the Lake. But Peña Blanca Lake would have served as a population sink for these individuals, in which large adults lived out their lives, but all of their progeny were consumed by introduced predators.

<u>Indirect Effects</u>

Two types of indirect effects are possible: 1) movement of non-target animals, plants, or disease organisms from Page Springs Hatchery to Peña Blanca Lake with the trout, and 2) trout fishing attracting anglers or others who would introduce other species.

Movement of non-target animals, plants, or diseases. Transportation of sport fish from hatcheries to wild sites has the potential to move non-target plants, mollusks, amphibians, diseases, and parasites with the fish. Bullhead catfish and some of the sunfishes likely were introduced unintentionally to the Southwest with stocks of more desirable sport fishes (Minckley and Marsh 2009). Dodd and Barichivich (2007) found evidence of inadvertent movement of bullfrog tadpoles with warm water fishes to Harris Neck National Wildlife Refuge, Georgia. Platz et al. (1990) indicated the most likely way that Rio Grande leopard frogs (*Lithobates berlandieri*) arrived in Arizona was via unintentional transport with warm water fishes from a hatchery in New Mexico. Presence of Plains leopard frogs (*Lithobates blairi*) well outside of their range at the Utah State Fish Hatchery near Glen Canyon City is also likely the result of inadvertent transport with fish stocks. Green and Dodd (2007) also documented *Bd* and amphibian microsporidian and myxozoan parasites in bullfrog tadpoles at four warmwater hatcheries in the southeastern U.S., which were likely moved inadvertently with stocks of hatchery fishes. A bullfrog in the outside ponds at Bubbling Ponds Fish Hatchery, adjacent to the Page Springs Hatchery, tested positive for *Bd* (V. Boyarski, pers. comm. 2009). Inadvertent transport of bullfrogs or their tadpoles with stocks of fish could move *Bd* or their parasites into stocked waters. *Bd* can also survive in water and remain infectious for 3-6 weeks (Johnson and

Speare 2003), so potentially the organism could be moved in the water in which the fish are transported. Retallick (pers. comm. in Wixson and Rogers 2009) found *Bd* on the scales of fathead minnows; however, swab, scrape, and fin samples from rainbow trout in ponds known to hatbor *Bd*- infected amphibians failed to test positive for the disease (Wixson and Rogers 2009).

The circumstances under which trout are produced at Page Springs and then transported to recipient sites greatly reduce the likelihood of transporting non-target organisms. The fish are produced in runways, separate from the warm water ponds where *Bd*-positive bullfrogs occur. The source of the water is a combination of a secured spring (Pond Spring) and a semi-exposed spring (Cave Spring) all with underground pipes, minimizing the chance of non-target organisms entering with the water. It is unlikely that non-target biota could become established due to the small area of exposed water before coming from the Cave Spring before it enters underground pipes. Moreover, the exposed portion of the Cave Spring is protected by a chain link fence, locked gate, and screened entrance. There are also metal screens that filter debris prior to entering the headbox and subsequent hatchery pipes. Introduction of non-target biota via more natural means (transmission via mammals or birds) is unlikely due to fast moving water which largely precludes use of Cave Spring by mammals and birds. No mollusks or vegetation have been found in the raceways with the trout. Furthermore, trout are moved directly from the raceways to the trucks for transport. These measures do not eliminate the possibility of moving non-target organisms with the fish, but the relatively sterile conditions under which the fish are produced greatly reduce that risk.

In regard to *Bd*, it has been present in the region since at least 1972 (Sycamore Canyon). It has been found in Chiricahua leopard frogs at Buenos Aires National Wildlife Refuge, as well (Cecil Schwalbe, pers. comm. 2009). Although not documented from the Peña Blanca area (no frogs have been tested to our knowledge), it is almost certainly present, given its long proximity at Sycamore Canyon. In recovery unit one, Chiricahua leopard frogs are persisting, if not thriving with the disease, unlike some regions (e.g. recovery unit 6 in New Mexico, U.S. Fish and Wildlife Service 2007). So, in the relatively unlikely event that the proposed action inadvertently resulted in the introduction of *Bd* to Peña Blanca Lake, it would not be expected to affect the frogs, because it is almost certainly already there and the frogs are not much affected by it in recovery unit one.

Trout fishing increasing the probability of other species introductions. The presence of sport fish at Peña Blanca Lake attracts significant numbers of anglers. These anglers bring with them boats and fishing gear that may be wet or have mud attached to them that could carry non-native snails, plants, plant seeds, or disease organisms such as *Bd.* Bilge tanks may carry water with disease organisms, fish, amphibians, or plants, which if discharged could inoculate the lake with these species.

Use of bait fish is illegal at Peña Blanca Lake, but use of tiger salamander as bait is not. Tiger salamanders would not be used as bait for trout; however, it is possible that an angler would not know that bass or catfish were no longer in the lake, and they may attempt to fish for these species with tiger salamanders. Such use would not be illegal. *Bd*- and ranavirus-infected tiger salamanders have been detected in bait shops in Arizona (Picco and Collins 2008). In a survey of anglers that use tiger salamanders as bait, 67% of them claimed to release bait salamanders into the bodies of water they fished, even though such release is strictly prohibited by AGFD fishing regulations (Picco and Collins 2008). Other illegal use of bait fish or crayfish could occur as well. If collected from the wild, these bait organisms are likely to come with some plant material, invertebrates, and potentially other non-target organisms. Again, bait fish, crayfish, and salamanders are not going to be used to fish for trout, but attracting anglers to Peña Blanca Lake is expected to inadvertently increase the likelihood of these activities.

These indirect effects, although carrying with them potentially serious consequences, are relatively unlikely to occur because the rainbow trout will not persist through the summer months. So the period over which anglers will be attracted to the Lake is a matter of months. Furthermore, as discussed above, if *Bd* was introduced via indirect effects, it is not expected to affect the conservation of or population persistence of the Chiricahua leopard frog in the action area (the disease is probably already there and the frogs are not much affected by it in recovery unit one). If the stocking under consideration in this consultation was of warm water fishes that would persist indefinitely, and which could be fished with salamanders or illegal bait fish or crayfish, the likelihood of these indirect effects manifesting would be much greater.

Summary

The status of the frog in recovery unit one, which is better and closer to recovery than in any other recovery unit, evolved during a time when Peña Blanca Lake supported a diverse fishery and a bullfrog population. So, predation by stocked trout over a period of a few months in the Lake is not expected to deter that recovery momentum. In addition, the indirect affects discussed above are relatively unlikely to occur given the short length of time that stocked trout are expected to persist.

CUMULATIVE EFFECTS

Cumulative effects include the effects 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 that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Most management actions in the action area are likely to be Federal due to the preponderance of Federal lands managed by the Coronado National Forest in the action area.

Anglers that come to Peña Blanca Lake for the trout fishing may decide they would like to fish for other species, as well, such as bass, catfish, and sunfish. Some, who harvested bullfrogs in the past from the lake, might also decide that species would be desirable to have at Peña Blanca once again. They could take it on their own to make these introductions, illegally. If that occurred, these species could become established in the Lake with sustaining populations, as was the case prior to the CERCLA project. Such ad hoc stockings are not likely to be accompanied by the strict protocols used by AGFD at their Page Springs Hatchery. Thus, it is much more likely that non-target organisms would be moved with these illegal stockings. Bluegill, redear sunfish, and green sunfish all became established in the Lake without the benefit of AGFD stocking. These species must have arrived via anglers or others who wished to see them established there. Similarly, bullfrogs were present in the Lake prior to them being stocked by AGFD. They likely arrived via releases by those who wished to hunt them, either as direct stocking into the lake or via immigration from another site stocked by bullfrog advocates.

Illegal smuggling and passage of undocumented aliens is common in the action area. These activities have resulted in illegal trails and roads, and deposition of trash. Illegals often build warming or cooking fires that have the potential to start wildfires, with deleterious effects to frog habitats.

CONCLUSION

After reviewing the current status of the Chiricahua leopard frog, the environmental baseline for the action area, the effects of the proposed rainbow trout stocking project at Peña Blanca Lake, and the cumulative effects, it is the FWS's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the Chiricahua leopard frog. No critical habitat has been designated for this species, therefore, none will be affected. We have come to this conclusion based on the following:

1) The stocked trout, although likely to prey upon Chiricahua leopard frog tadpoles, will not persist through the summer. So predation by trout on tadpoles will occur for only a few months and is not expected to eliminate Chiricahua leopard frogs from the Lake.

2) Indirect effects are relatively unlikely to occur because the trout are not expected to persist through the summer months.

3) If *Bd* was inadvertently introduced as a result, directly or indirectly, of the trout stocking, it is not expected to affect the conservation of or population persistence of the Chiricahua leopard frog in recovery unit one because 1) the disease is probably already present in the action area, and 2) frogs are not much affected by the disease in recovery unit one.

The conclusions of this biological opinion are based on full implementation of the project as described in the <u>Description of the Proposed Action</u> 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 WSFR so that they become binding conditions of any grant or permit issued to the AGFD, as appropriate, for the exemption in section 7(o)(2) to apply. WSFR has a continuing duty to regulate the activity covered by this incidental take statement. If WSFR (1) fails to assume and implement the terms and conditions or (2) fails to require AGFD 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, WSFR 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

The FWS anticipates that all tadpoles in the lake during the residence time of the stocked rainbow trout will be incidentally taken as a result of this proposed action. The incidental take is expected to be in the form of predation by the introduced rainbow trout. Other possible forms of incidental take, discussed above in the Effects of the Action, are not reasonably certain to occur and thus are not anticipated herein. Should any of those other possible forms of incidental take occur, then incidental take will have been exceeded.

EFFECT OF THE TAKE

In this biological opinion, the FWS determines that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of critical habitat for the reasons stated in the Conclusions section.

REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS

In order to be exempt from the prohibitions of section 9 of the Act, you must comply with the following term and condition, which implement the reasonable and prudent measure described below and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

The following reasonable and prudent measure, with its accompanying terms and conditions, is necessary and appropriate to minimize incidental take of the Chiricahua leopard frog:

2. In coordination with the Coronado National Forest and AGFD, WSFR shall post an informational sign at Peña Blanca Lake for anglers and recreationists.

    A. A sign shall be posted in a prominent place at Peña Blanca Lake that will include, at a minimum, the fishing regulations for Peña Blanca Lake, including that use of live bait (excluding salamanders) is illegal, release of any live animals is illegal, and that the only sport fish currently in the Lake is rainbow trout. This sign shall be in place before the first rainbow trout stocking event occurs. The sign must be maintained through the period when trout persist in the Lake.

    B. WSFR shall, within 15 days of the erection of the sign described in 1.a., submit to Arizona Ecological Services a brief, written report of the installation of the sign and the text of the sign.

Review requirement: The reasonable and prudent measure, with its implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action, but will also allow assessment of whether anticipated incidental take has been exceeded. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The WSFR must immediately provide an explanation of the causes of the taking and review with the Arizona Ecological Service Office the need for possible modification of the reasonable and prudent measures.

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 state.

CONSERVATION RECOMMENDATIONS

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

1) We recommend that WSFR assist us with all aspects of recovery for the Chiricahua leopard frog, as described in the 2007 recovery plan.

REINITIATION NOTICE

This concludes formal consultation on the proposed stocking of rainbow trout at Peña Blanca Lake. 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 CH 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.

For further information, please contact Jim Rorabaugh (x230) or Sherry Barrett (x223) of my staff at (520) 670-6150. Please refer to consultation number 22410-2009-F-0279R1 in future correspondence concerning this project.

Sincerely,

/s/ Steven L. Spangle
Field Supervisor

cc: Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ

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