United States Department of the Interior

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In Reply Refer to:
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22410-2010-F-0396
22410-2011-F-0113
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02-21-88-F-0114
02-21-96-F-0160

June 6, 2011

Memorandum

To: Field Office Manager, Bureau of Land Management, Safford Field Office, Safford, Arizona

From: Field Supervisor

Subject: Request for Formal Consultation Pursuant to Section 7 of the Endangered Species Act for the Proposed Translocation of Desert Pupfish or Gila Topminnow into Porter Wash Pond, and the Proposed Translocation of Gila Chub, Desert Pupfish, and Gila Topminnow in the Sands Draw Wildlife Exclosure

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your requests were dated May 14, 2010 (Porter Wash Pond) and October 14, 2010 (Sands Draw Wildlife Exclosure), and received by us on May 19, 2010 and October 19, 2010, respectively. At issue are effects that may result from continuing and future management actions on populations of endangered Gila chub (*Gila intermedia*) and its critical habitat, endangered Gila topminnow (*Poeciliopsis occidentalis occidentalis*), and endangered desert pupfish (*Cyprinodon macularius*) and its critical habitat in the Porter Wash Pond and Sands Draw Wildlife Exclosure (Sands Draw Exclosure), Graham County, Arizona. The proposed actions may affect, and are likely to adversely affect, the endangered Gila chub, the endangered Gila topminnow, and the endangered desert pupfish. This biological opinion is also a reinitiation of the Safford District Resource Management Plan (#02-21-88-F-0114, #02-21-05-F-0086) and the Safford and Tucson Field Offices' Livestock Grazing Program (#02-21-96-F-0160).

This biological opinion is based on information provided in the May 2010 and October 2010 (revised April 2011) biological evaluations and other sources of information as detailed in the consultation

history and literature cited. Literature cited in this biological opinion is not a complete bibliography of all literature available on the species of concern or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

As stated in the BE, the effects of all actions associated with moving, stocking, and extracting fish have been analyzed as part of the section 10(a)(1)(A) research and recovery permit held by AGFD (TE-821577), and will not be included in this analysis. Also, the effects of all actions associated with surveying or monitoring the fish have been analyzed as part of the section 10(a)(1)(A) research and recovery permit held by your office (TE030115-0), and will not be included in this analysis.

CONSULTATION HISTORY

- May 19, 2010 – We received the Biological Evaluation and request to initiate consultation on the effects of the proposed translocation of Gila topminnow or desert pupfish into the Porter Wash Pond.

- July 9, 2010 – We sent you a memorandum stating that we received sufficient information to begin formal consultation on the Porter Wash Pond project.

- October 14, 2010 – We sent you a memorandum requesting a 60-day extension to complete formal consultation for the Porter Wash Pond project.

- October 19, 2010 -- We received the Biological Evaluation and request to initiate consultation on the effects of the proposed translocation of Gila chub, Gila topminnow, and desert pupfish into the Sands Draw Exclosure.

- October 25, 2010 – We received an e-mail from you agreeing to the 60-day extension we requested on October 14, 2010, for the Porter Wash Pond project.

- April 1, 2011 – We sent a memorandum to you requesting additional time to complete formal consultation, extending the due date for the final biological opinion to April 30, 2011, for the Porter Wash Pond and Sands Draw Exclosure projects.

- April 5, 2011 – We received an e-mail from your office agreeing to the additional days that we requested on April 1, 2011.

- April 19, 2011 – We sent the draft biological opinion for the Porter Wash Pond and Sands Draw Exclosure projects to you for your review and comment.

- April 22, 2011 – We received your comments on the draft biological opinion that we sent to you on April 19, 2011.

- April 27, 2011 -- We received the edited Sands Draw Wildlife Exclosure BE with your change to the proposed action and effects analysis.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

Description of the Action Area

The Porter Wash Pond (Figure 1) and Sands Draw Exclosure (Figure 2) are located entirely on public lands administered by BLM. The Porter Wash Pond is a small (20 feet X 20 feet) aquatic habitat that will be excluded from livestock using a pipe rail or sucker rod fence before fish are stocked. Due to the pond lacking habitat complexity and size, only one species will be stocked. The Porter Wash Pond is located northeast of the Gila River near Fort Thomas, Arizona. The Sands Draw Exclosure is a 423-acre fenced exclosure (recently reconstructed) located in the San Simon Valley, in the vicinity of San Simon River north of Bowie, Arizona. The action areas include the areas within the exclosure fences at each site, and approximately a one-mile radius around these sites. This is the maximum extent of the possible effects from activities associated with maintaining the sites and possible effects from continuing activities in the area to listed fish that are proposed to be introduced to the sites.

Continuing and Future Management

A. Livestock Management

The Porter Wash Pond is located on the Tom Spring allotment. Currently, the allotment is divided into four pastures and managed as a yearlong cow-calf operation with 97 (1,164 AUMS) head of cattle permitted. The Sands Draw Exclosure is within the Badger Den Allotment, San Simon Valley. Grazing privileges on this allotment were cancelled by Safford Field Office for failure of permittee to follow grazing regulations. Although there is no current grazing on the allotment, privileges may be reinstated or transferred at a later date. Both allotments will be managed to meet standards and guidelines, which include managing for soil stability and desired rangeland vegetation and cover.

The BLM will follow 43 CFR Ch. II Subpart 4150 (Unauthorized Grazing Use) if trespass livestock are detected within either exclosure to ensure their removal as soon as possible. Fencing repair and maintenance will be implemented by BLM as needed to keep fences intact and functioning.

B. Recreation Management

Recreational activity at the Porter Wash Pond is nonexistent at this time as it is isolated and provides limited to no recreational opportunities for the public. Recreational activity at the Sands Draw Exclosure is limited to nonexistent due to its isolation and management as an exclosure. The Sands Draw Exclosure area may receive some use from hunters during the different hunting seasons, but this activity, if occurring, has not been documented at the Sands Draw Exclosure. It is anticipated that current level of use will remain the same for both sites into the future.

C. Salt Cedar Removal and Control

The proposed action includes removing invasive plant species from specified areas by a combination of chemical and/or mechanical treatments. By removing salt cedar, native vegetation will have the opportunity to re-sprout without competition through existing seed sources present on-site or by actively re-seeding the sites. The specific methods and areas to treat are detailed in the appropriate Environmental Assessments.

1. Herbicide treatment:

No herbicides will be applied at or adjacent to the Porter Wash Pond. The Pesticide Use Proposals (PUP) for the Sands Draw Exclosure specifies the amounts and application methods to be followed in using Habitat®, the preferred herbicide. All herbicide applications within the Sands Draw Exclosure, including near or adjacent to aquatic habitat, will follow the PUP requirements. Pruning loppers, knives, or chainsaws will be used to cut salt cedar stems as close to the ground as possible. Herbicide would then be applied directly to the freshly-cut stump, either by spraying at close range (1-3 inches) with a hand-held spray bottle or by applying with a brush. This method will minimize the amount of herbicide used and will prevent the spread of the herbicide to the soil, water, or non-target plants. Chemical removal of salt cedar near or adjacent to aquatic habitat will be infrequent as native vegetation is currently establishing and will likely reduce or prevent salt cedar establishment in the future. Even though the likelihood of herbicides entering the aquatic habitat is remote, vegetation buffers are currently being developed to capture and retain sediments and pollutants that could enter the aquatic habitats and affect water quality, aquatic/riparian vegetation, and any aquatic organisms present.

2. Mechanical treatment:

A variety of mechanical methods (*e.g.*, cutting and/or pulling) may be used to remove salt cedar from the Porter Wash Pond and Sands Draw Exclosure exclosures. Mechanical removal will focus on trees small enough to be pulled or dug out, such as saplings. Mechanical removal of salt cedar will be an on-going management action as seed sources exist adjacent to the exclosures and throughout the Gila Valley and San Simon Valley, and reinvasion is likely.

D. Pond Maintenance

Pond maintenance activities, which include the removal of sedges, cattails, and any other invasive aquatic and/or riparian vegetation, will be conducted at least bi-annually to prevent their spread and maintain open water. Mechanical harvesting (cutting, digging, and/or pulling) to remove invasive plant species will be accomplished by hand. Additionally, sediment removal using a bulldozer or backhoe will be used as needed to maintain open water and appropriate depths for fish populations. It is estimated that this maintenance may be required every three to five years.

Conservation Measures

As part of the proposed reestablishment of these fish and ongoing actions, your office has committed to implementing certain measures devised to reduce effects of the proposed actions on Gila chub, desert pupfish, and Gila topminnow. You will:

1. Monitor all stocked populations of Gila chub, desert pupfish, and Gila topminnow at least annually with the AGFD and us.
2. Repair and maintain the fences as needed to prevent livestock from entering the exclosures.
3. Monitor the water levels at least bi-annually, and take corrective actions, if necessary, to maintain appropriate water depths.
4. Evaluate, monitor, and modify, as needed, activities that may result in take of Gila chub, desert pupfish, and Gila topminnow or destruction of pupfish, chub, and topminnow habitat to reduce potential adverse effects to pupfish, chub, and topminnow.
5. Conduct informational and environmental education programs pertaining to native fish and their habitats.
6. Coordinate with AGFD and us if the sites no longer support the species due to habitat suitability.
7. Limit excavation of either pond to a maximum of 25% of the original pond size at one time in order to minimize harm to fish.
8. Only use herbicide at the Sands Draw Exclosure when wind speeds are ten miles per hour or less.
9. Continue to develop vegetation buffers to capture and retain sediments and pollutants that could enter the aquatic habitats and affect water quality, aquatic/riparian vegetation, and any aquatic organisms present.
10. To minimize harm during maintenance and non-native and invasive vegetation removal activities at the ponds:

    a. Mechanical harvesting (cutting, digging, and/or pulling) to remove invasive plant species will be by hand. Vegetation will be gently moved up and down through the water column and then checked for eggs and fish prior to removal.

    b. Pond maintenance activities will not be conducted during the primary breeding season, which starts when water temperatures exceed 20º C (U.S. Fish and Wildlife Service 1993).

STATUS OF THE SPECIES

Gila chub

The Gila chub was listed as endangered with critical habitat on November 2, 2005 (U.S. Fish and Wildlife Service 2005). Historically, Gila chub have been recorded in approximately 43 rivers, streams, and spring-fed tributaries throughout the Gila River basin in southwestern New Mexico, central and southeastern Arizona, and northern Sonora, Mexico (Miller and Lowe 1967, Rinne and Minckley 1970, Minckley 1973, Rinne 1976, DeMarais 1986, Weedman et al. 1996, U.S. Fish and Wildlife Service 2005). Only about 30 of these populations are currently occupied, and all of these are small, isolated, and face one or more threats (Weedman et al. 1996, U.S. Fish and Wildlife Service 2005). These populations occur in tributaries of the Agua Fria, Babocamari, Gila, San Francisco, San Pedro, Santa Cruz, and upper Verde rivers in Cochise, Coconino, Gila, Graham, Greenlee, Pima, Pinal, Santa Cruz, and Yavapai counties in Arizona, and in Grant County, New Mexico (Weedman et al. 1996, U.S. Fish and Wildlife Service 2005).

For additional information about the Gila chub see Desert Fishes Team (2003), Minckley and DeMaris (2000), Propst (1999), Rinne and Minckley (1991), DeMaris (1986), and Minckely (1973, 1985), the Arizona Department of Game and Fish status review (Weedman *et al.* 1996), the U.S. Fish and Wildlife Service proposed rule and final rules listing the species (U.S. Fish and Wildlife Service 2002, 2005), the New Mexico recovery plan for the species (Carman 2006), and references cited therein.

Taxonomy

Baird and Girard (1854) published a description of the Gila chub, as *Gila gibbosa*, based on the type specimen collected in 1851 from the Santa Cruz River. For nomenclature reasons, the name was changed by Girard to *Tigoma intermedia* in 1856, working with specimens from the San Pedro River. Despite that and other name changes, the Gila chub has been recognized as a distinct species since the 1850's, with the exception of a short period in the mid-1900's when it was placed as a subspecies of the roundtail chub *Gila robusta* (Miller 1946). For the past 30 years, *Gila intermedia* has been recognized as a full monotypic species, separate from the polytypic species *Gila robusta*, both currently accepted as valid (Robbins *et al.* 1991, Mayden *et al.* 1992, Nelson et al. 2004). Problematic populations nonetheless exist, variously assigned to one or the other taxa and leading to continued confusion. Further complicating matters, Minckley and DeMarais (2000) described a new subspecies within the Gila River Basin, *Gila nigra*, the headwater chub. It is of hybrid origin derived from *Gila robusta* and *Gila intermedia*. Its range is similar to that of *Gila intermedia* and is another headwater type chub, whereas, *Gila robusta* is found in the mainstem of the major rivers within the Gila River Basin. Dowling et al. (2008) reported on the genetics of many of the extant populations of these three Gila River chubs and recommended management units based on this information.

Life History

The Gila chub is a member of the minnow family Cyprinidae. The Gila chub is small-finned, deep-bodied, chubby (chunky), and darkly colored (sometimes lighter on belly; diffuse lateral band(s) are rarely present). Adult males average about 6 inches (150 mm) in total length; females can exceed 10 inches (250 mm) (Rinne and Minckley 1991). Scales are course, large, thick, and broadly overlapped, and radiate out from the base. Lateral-line scales usually number greater than 61 and less than 80. There are usually eight (rarely seven or nine) dorsal and anal fin-rays; pelvic fin-rays typically number eight, but sometimes nine (Minckley 1973, Rinne 1976, Weedman et al. 1996, Minckley and DeMarais 2000).

Gila chub commonly inhabit pools in smaller streams, springs, and cienegas, and can survive in small artificial impoundments (Miller 1946, Minckley 1973, Rinne 1975, Weedman et al. 1996). Gila chub are highly secretive, preferring quiet, deeper waters, especially pools, or remaining near cover like terrestrial vegetation, boulders, and fallen logs (Rinne and Minckley 1991). Undercut banks created by overhanging terrestrial vegetation with dense roots growing into pool edges provide ideal cover (Nelson 1993). Gila chub can survive in larger stream habitat such as the San Carlos River, and artificial habitats, like the Buckeye Canal (Stout *et al.* 1970, Rinne 1976). Gila chub are also easily cultured in a hatchery setting (Schultz and Bonar 2007).

Gila chub interact with spring and small stream fishes regularly (Meffe 1985), but are usually restricted to deeper waters (Minckley 1973). Adults often are found in deep pools and eddies below areas with swift current. Young-of-the-year inhabit shallow water among plants or eddies, while older juveniles

use higher velocity stream areas (Minckley 1973, Minckley and Deacon 1991). Gila chub feed on both plants and animals. Adults appear to be principally carnivorous, feeding on large and small terrestrial and aquatic insects and sometimes other small fishes. Smaller individuals often feed on organic debris and aquatic plants, especially filamentous (threadlike) algae, and less intensely on diatoms (unicellular or colonial algae) (Griffith and Tiersch 1989, Rinne and Minckley 1991).

Spawning typically occurs from late spring into summer (Minckley 1973; Griffith and Tiersch 1989; Nelson 1993). Breeding males display deep red or orange coloration on ventral surfaces and paired fin bases (Minckley 1973, Rinne 1976). Spawning is likely sporadic over a long reproductive season (Rinne and Minckley 1991), and in constant warm water temperature settings such as springs, Gila chubs can spawn throughout the year (Minckley 1973, 1985, Griffith and Tiersch 1989). Spawning likely occurs over beds of submerged aquatic vegetation or root wads, with large females being followed by several smaller males (Minckley 1973). Males and females reach sexual maturity in one to three years at lengths of 90 to 95 mm (3.6-3.8 in)(Griffith and Tiersch 1989). Gila chub spawn at water temperatures warmer than 17° C (62° F), with optimal water temperatures of 20° to 24° C (68 to 75° F) (Nelson 1993), and optimal temperatures for growth of 24° to 28° (Schultz and Bonar 2007). Gila chub likely live up to four years or more (Griffith and Tiersch 1989).

Threats

Decline of Gila chub is primarily due to habitat loss from various land use practices and predation and competition from nonnative fish species, and the highly fragmented and disconnected nature of the remaining Gila chub populations increases their vulnerability to these threats (U.S. Fish and Wildlife Service 2005). Land uses that have caused past habitat loss and continue to threaten Gila chub habitat include hydrologic modification of rivers, springs, and cienegas for human uses (groundwater pumping, dewatering, diversion of water channels, impoundments, and flow regulation), poorly managed livestock grazing, logging and fuel wood cutting, road construction and use, recreation, mining, and urban and agricultural development U.S. Fish and Wildlife Service 2005). All of these activities have promoted erosion and arroyo formation and the introduction of predacious and competing nonnative fish species (Miller 1961, Minckley 1985), and at least one or some combination of these activities is occurring in all of the remaining populations. Wildfires and wildfire suppression activities also pose a threat to the remaining populations by causing water temperature and quality changes that can kill fish, (Rinne 2004, U.S. Fish and Wildlife Service 2005), negatively altering food base for fishes (Earl and Blinn 2003), and resulting in stream and riparian vegetation alteration that negatively affects fish habitat (U.S. Fish and Wildlife Service 2004).

Perhaps the most serious threat to Gila chub is predation by and competition with nonnative organisms, including numerous nonnative fish species, bullfrogs (*Rana catesbeiana*), and virile crayfish (*Orconectes virilis*). The impacts of nonnative fish species on native fish including Gila chub have been well documented (Hubbs 1955, Miller 1961, Minckley and Deacon 1968, Minckley 1973, Meffe 1985, Minckley 1985, Moyle 1986, Williams and Sada 1985, Minckley and Deacon 1991, Ruppert *et al.* 1993, Clarkson et al. 2006). Dudley and Matter (2000) correlated green sunfish presence with Gila chub decline, documented green sunfish predation on Gila chub, and found that even small green sunfish readily consume young-of-year Gila chub. Dudley (1995) found that green sunfish appeared to displace both subadult and adult Gila chub from preferred habitats, found that Gila chub utilized similar habitat types to green sunfish indicating competition for food and space was likely occurring, and concluded that predation by and/or competition with green sunfish virtually eliminated small chub from where the

two species co-occurred, indicating recruitment failure. Unmack *et al.* (2003) similarly found that green sunfish presence was correlated with the absence of young-of-year Gila chub in Silver Creek. Nonnative fish parasites, such as Asian tapeworm (*Bothriocephalus acheilognathi*) also may be a threat to Gila chub (U.S. Fish and Wildlife Service 2005).

An important new threat to all native aquatic life in the southwest United States is global climate change. There is model evidence now that global climate change could result in significant reductions in streamflow in the southwest due to warmer average temperatures, further straining threats to Gila chub and its habitat (Seager et al. 2007, U.S. Climate Change Science Program 2008). The U.S. Census predicts that Arizona will be the second fastest growing state in the country through 2030, adding an additional 5.6 million people (U.S. Census Bureau 2005). If these predictions hold true, already severe threats to Gila chub and its habitat will worsen, primarily due to increased human demand for surface and ground water and decreased supply. The climate change-driven effects will also result in warmer water temperatures in southwestern streams, which are more likely to favor nonnative fishes. Rahel et al. (2008) examined climate change models, nonnative species biology, and ecological observations, and concluded that climate change could foster the expansion of nonnative aquatic species into new areas, magnify the effects of existing aquatic nonnative species where they currently occur, increase nonnative predation rates, and heighten the virulence of disease and parasite outbreaks. Drying of stream channels will also create less habitat and greater competition due to limited space and habitat. Thus climate change can eliminate Gila chub habitat through at least two mechanisms: directly, by drying up aquatic habitats due to decreases in runoff and stable or increasing human demand for water resources; and indirectly by improving conditions for nonnative species, increasing their proliferation, and thereby increasing the threat from nonnative fish predation and competition.

For a more detailed discussion of how these threats affect Gila chub, its critical habitat, and the closely related headwater chub and roundtail chub, see U.S. Fish and Wildlife Service (2005, 2006, 2009).

Status and Distribution

Historically, Gila chub were recorded in approximately 43 rivers, streams, and spring-fed tributaries throughout the Gila River basin in southwestern New Mexico, central and southeastern Arizona, and northern Sonora, Mexico (Miller and Lowe 1967, Rinne and Minckley 1970, Minckley 1973, Rinne 1976, DeMarais 1986, Weedman et al. 1996). Only about 30 of these populations are currently occupied, and all of these are small, isolated, and face one or more threats (Weedman et al. 1996, U.S. Fish and Wildlife Service 2005). Historically, the range of the Gila chub was more widespread throughout the southeast quadrant of Arizona, and currently occupied sites were likely much more expansive. The Gila chub now occupies an estimated 10 to 15 percent of its historical range (Weedman et al. 1996, U.S. Fish and Wildlife Service 2005), and is limited to about 30 small, isolated, and fragmented populations throughout the Gila River basin in Arizona and New Mexico (U.S. Fish and Wildlife Service 2005). Of these populations, ten are estimated to be stable-threatened, meaning the Gila chub are considered common, but face threats from non-native species and/or habitat-altering land uses, or a lack of recruitment was detected in the population. The remaining known extant populations are considered unstable-threatened, indicating that Gila chub are rare, have a limited distribution, predatory or competitive non-native species are present, or the habitat is modified or threatened habitat-altering land uses occur (Weedman et al. 1996, U.S. Fish and Wildlife Service 2005).

In the Verde River basin, the Walker Creek, Red Tank Draw, and Spring Creek populations (Yavapai County) are considered stable-threatened, but the status of the Williamson Valley Wash population is unknown. The Santa Cruz River has three tributaries with extant populations of Gila chub: Sabino Canyon (Pima County) and Sheehy Spring (Santa Cruz County) have unstable-threatened populations, and Cienega Creek (Pima and Santa Cruz Counties) has the only known naturally-occurring stable-secure population of Gila chub. The San Pedro River basin has three extant, stable-threatened populations in Redfield Canyon (Graham and Pima Counties), O'Donnell Creek (Santa Cruz County), and Bass Canyon (Graham and Cochise Counties). Gila chub still occupy T4 Spring in the Babocomari River basin (Santa Cruz and Cochise counties), but it is very rare in this spring. The San Carlos River and the Blue River, (Gila and Graham counties), tributaries of the Gila River located on the San Carlos Apache Indian Reservation, are believed to have extant populations of Gila chub, but Tribal survey information is confidential and proprietary (U.S. Fish and Wildlife Service 2005).

The San Francisco River has two tributaries with extant stable-threatened populations, Harden Cienega Creek and Dix Creek (Greenlee County). The Agua Fria River has four tributaries with stable-threatened populations, Larry, Lousy, Silver and Sycamore Creeks (Yavapai County), as well as two unstable-threatened populations in Little Sycamore Creek and Indian Creek (Yavapai County). Two tributaries of the Gila River in Arizona have extant populations of Gila chub: Eagle Creek (Graham and Greenlee Counties), has an unstable threatened population and Bonita Creek (Graham County), has a stable-threatened population which is now somewhat protected by placement of a fish barrier and chemical renovation of the stream in 2008, although green sunfish and Gila topminnow have since reinvaded and additional renovation is planned (U.S. Fish and Wildlife Service 2005, U.S. Bureau of Reclamation and Bureau of Land Management 2010, Marsh and Associates 2009).

In Mexico, Gila chub occurred in two small spring areas, Cienega los Fresnos and Cienega la Cienegita, adjacent to the Arroyo los Fresnos (tributary to the San Pedro River), within 2 km (1 mi) of the Arizona-Mexico border as recently as 1992, but are now thought to be extirpated (Varela-Romero *et al.* 1992, D. Duncan, FWS, pers. comm., 2009). No Gila chub remain in the Mexican portion of the Santa Cruz River (Weedman *et al.* 1996).

Reestablishment of Gila chub has been attempted in at least six Arizona sites. Lousy Canyon and Larry Creek, stocked with 200 Gila chub from Silver Creek in July 1995, are extant. Gardner Canyon (Cochise County) was stocked from Turkey Creek (Santa Cruz County) with 150 Gila chub in July 1988. In May 1995, no Gila chub or any other fish were captured during surveys. Turkey Creek, a tributary to the Babocomari River, was stocked with a small number of Gila chub in 2005, but is now thought to be extirpated (C. Crowder, AGFD, pers. comm., 2010). In 2005, Bear and Romero canyons in the Santa Rita Mountains were stocked with Gila chub from Sabino Canyon. Gila chub now appear extirpated from Bear Canyon (D. Mitchell, AGFD, pers. comm., 2009), but are doing well in Romero Canyon, where they can be considered stable-threatened (Ehret and Dickens 2009).

Gila Chub Critical Habitat

Critical habitat for Gila chub is designated for approximately 160.3 miles of stream reaches in Arizona and New Mexico that includes cienegas, headwaters, spring-fed streams, perennial streams, and spring-fed ponds. Critical habitat includes the area of bankfull width plus 300 feet on either side of the banks.

The bankfull width is the width of the stream or river at bankfull discharge (i.e., the flow at which water begins to leave the channel and move into the floodplain) (Rosgen 1996, U.S. Fish and Wildlife Service 2005). Critical habitat is organized into seven areas or river units:

Area 1 - Upper Gila River, Grant County, New Mexico, and Greenlee County, Arizona, includes Turkey Creek (New Mexico), Eagle Creek, Harden Cienega Creek, and Dix Creek;

Area - 2, Middle Gila River, Gila and Pinal Counties Arizona, consists of Mineral Creek;

Area - 3, Babocomari River, Santa Cruz County, Arizona includes O'Donnell Canyon and Turkey Creek (Arizona);

Area 4 - Lower San Pedro River, Cochise and Graham counties, Arizona, includes Bass Canyon, Hot Springs Canyon, and Redfield Canyon;

Area 5 - Lower Santa Cruise River, Pima County, Arizona, includes Cienega Creek, Mattie Canyon, Empire Gulch, and Sabino Canyon;

Area 6 - Upper Verde River, Yavapai County, Arizona, includes Walker Creek, Red Tank Draw, Spring Creek, and Williamson Valley Wash; and

Area 7 - Agua Fria River, Yavapai County, Arizona, includes Little Sycamore Creek, Sycamore Creek, Indian Creek, Silver Creek, Lousy Canyon, and Larry Creek (U.S. Fish and Wildlife Service 2005).

There are seven primary constituent elements of critical habitat, which include those habitat features required for the physiological, behavioral, and ecological needs of the species:

1) Perennial pools, areas of higher velocity between pools, and areas of shallow water among plants or eddies all found in headwaters, springs, and cienegas, generally of smaller tributaries;

2) Water temperatures for spawning ranging from 63°F to 75 °F, and seasonally appropriate temperatures for all life stages (varying from about 50°F to 86 °F);

3) Water quality with reduced levels of contaminants, including excessive levels of sediments adverse to Gila chub health, and adequate levels of pH (e.g. ranging from 6.5 to 9.5), dissolved oxygen (i.e., ranging from 3.0 ppm to 10.0 ppm) and conductivity (i.e., 100 mmhos to 1,000 mmhos);

4) Prey base consisting of invertebrates (i.e., aquatic and terrestrial insects) and aquatic plants (i.e., diatoms and filamentous green algae);

5) Sufficient cover consisting of downed logs in the water channel, submerged aquatic vegetation, submerged large tree root wads, undercut banks with sufficient overhanging vegetation, large rocks and boulders with overhangs, a high degree of stream bank stability, and a healthy, intact riparian vegetation community;

6) Habitat devoid of non-native aquatic species detrimental to Gila chub or habitat in which detrimental nonnative species are kept at a level that allows Gila chub to continue to survive and reproduce; and

7) Streams that maintain a natural flow pattern including periodic flooding.

In 2011, the U.S. Fish and Wildlife Service formed a recovery team for Gila chub to develop and implement a recovery plan for the species. Until the recovery plan is completed, there is limited information with which to evaluate the ability of critical habitat to meet the recovery needs of the species, or how an action may alter the ability of critical habitat to meet recovery needs. In lieu of a recovery plan, assessing the functionality of each of the PCEs of a given reach of critical habitat, and how an action might affect the PCEs of that reach, can provide some insight into the effects of an action on the functionality of critical habitat in terms of recovery.

Gila Topminnow

Gila topminnow was listed as endangered in 1967 without critical habitat (32 FR 4001). Only Gila topminnow populations in the United States, and not in Mexico, are listed under the ESA. 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). Life history information can be found in the 1984 recovery plan (U.S. Fish and Wildlife Service 1984), the draft revised Gila topminnow recovery plan (Weedman 1999), and references cited in the plans.

Gila topminnow are highly vulnerable to adverse effects from nonnative aquatic species (Johnson and Hubbs 1989). Predation and competition from nonnative fishes have been a major factor 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 overall, 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 many predatory and competitive nonnative fish, frogs, crayfish, and other species, Gila topminnow could no longer survive in many of their former 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.

Gila topminnow was listed as *Poeciliopsis occidentalis*. The species was later revised to include two subspecies, *P. o. occidentalis* and *P. o. sonoriensis* (Minckley 1969, 1973). *P. o. occidentalis* is known as the Gila topminnow, and *P. o. sonoriensis* is known as the Yaqui topminnow. *Poeciliopsis occidentalis*, including both subspecies, is collectively known as the Sonoran topminnow. Both subspecies are protected under the ESA.

Historically, the Gila topminnow was abundant in the Gila River drainage in Arizona and was one of the most common fishes of the Colorado River basin, particularly in the Santa Cruz system (Hubbs and Miller 1941). Gila topminnow also were recorded from the Gila River basin in New Mexico. In the last 50 years, this was reduced to only 16 naturally occurring populations. Presently, only 10 of the 16

known natural Gila topminnow populations are considered extant (Weedman and Young 1997, Voeltz and Bettaso 2003). Only eight have no nonnative fish present and therefore can be considered secure for the moment from nonnative fish threats. There have been at least 200 wild sites stocked with Gila topminnow, however, topminnow persist at only 30 of these localities. Of the 23, one site is outside topminnow historic range and one contains nonnative fish (Voeltz and Bettaso 2003). All of these sites except one are in New Mexico. Many of the reestablished sites are very small and may not contain viable populations. In addition several of the 30 sites have been reestablished in the last few years, and their eventual disposition is unknown.

The Sonoran Topminnow Recovery Plan (U.S. Fish and Wildlife Service 1984) established criteria for down- and de-listing. Criteria for down-listing were met for a short period. However, due to concerns regarding the status of several populations, down-listing was delayed. Subsequently, the number of reestablished populations dropped below that required for down-listing, where it has remained. The Yaqui topminnow is now included within the Yaqui Fishes Recovery Plan (U.S. Fish and Wildlife Service 1995). A draft revised recovery plan for the Gila topminnow is available (Weedman 1999). The plan's short-term goal is to prevent extirpation of the species from its natural range in the US and reintroduce it into suitable habitat within historic range. Downlisting criteria require a minimum of 82 reestablished populations, some of which have persisted at least 10 years.

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 about 30 localities (10 natural and 23 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. 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.

Desert Pupfish

We listed the desert pupfish as an endangered species, with critical habitat, on April 30, 1986 (U.S. Fish and Wildlife Service 1986). The desert pupfish recovery plan was finalized in 1993. The objective of the recovery plan is to downlist the species, as delisting the species is not considered feasible in the foreseeable future. In order to attain this objective the following actions are necessary: protection of natural populations, reestablishment of new populations, establishment and maintenance of refuge populations, development of protocols for the exchange of genetic material between stocked pupfish populations, determination of factors affecting population persistence, and information and education to foster recovery efforts (U.S. Fish And Wildlife Service 1993). The name desert pupfish is often incorrectly applied to all 10 pupfish species in the American Southwest (Williams *et al.* 1989, Pister 1996). In Arizona, there are currently three identified pupfish 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). Both the desert pupfish and Quitobaquito pupfish, which were considered the same species (*C. macularius*) at the time of listing in 1986, are endangered. Critical habitat has been designated in Arizona at Quitobaquito Spring and in California along parts of San

Felipe Creek, Carrizo Wash, and Fish Creek Wash (U.S. Fish and Wildlife Service 1986) in the vicinity of the Salton Sea (Moyle 2002). Critical habitat for desert pupfish is not located within the action area.

The desert pupfish is a member of the family Cyprinodontidae. Desert pupfish are usually less than 3.0 inches (7.6 cm) in total length (TL); adults are more often 1.6-2.0 inches (4.1-5.1 cm) TL. Males are larger than females and become bright blue during the breeding season.

Under the proper conditions, desert pupfish may begin breeding as early as six weeks of age, but most breeding does not occur until their second summer (Moyle 2002). Male pupfish are intensely territorial during the breeding season. The males patrol and defend individual territories that are 5.4 to 22 square feet (0.8-3.4 square meter) and in water less than 3 feet (0.8 meters) deep (Barlow 1961, Minckley 1973, Moyle 2002).

The desert pupfish breeding system includes consort-pair breeding and territoriality (U.S. Fish and Wildlife Service 1993). Territoriality develops in large habitats with high primary productivity, limited breeding substrates, and high population densities. Consort-pair breeding usually occurs in habitat with low primary productivity, low population density, or abundant breeding habitat (Kodric-Brown 1981). Female desert pupfish lay only one egg at a time (Constantz 1981). One female may produce 50-800 eggs in one season (Crear and Haydock 1971). The life span of an individual is one to three years in the wild (Minckley 1973, Moyle 2002, Kynard and Garrett 1979).

Larval desert pupfish feed on invertebrates (Crear and Haydock 1971). Adult pupfish are omnivorous and may feed on algae, invertebrates, detritus, and plants (Cox 1966, 1972; Naiman 1979). Pupfish are active during the day. Desert pupfish have been found in a variety of habitats, from the margins of large rivers to springs and cienegas. Pupfish can survive extremely harsh conditions that are lethal to most other fishes. They can survive temperatures up to 113^{o}F (Lowe *et al*. 1967), dissolved oxygen concentrations to 0.1-0.4 mg/l (Barlow 1958), and high salt concentrations of 68 g/l (Lowe *et al*. 1967). Pupfish can also tolerate sudden changes in both temperature and salinity (Kinne 1960, Lowe and Heath 1969).

Historical distribution of desert pupfish included the Gila River basin, lower Colorado River, Rio Sonoyta basin, 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, Miller and Fuiman 1987). Historical collection localities occurred in Mexico in Baja California and Sonora and in the United States in California and Arizona. Populations and distribution probably expanded and contracted historically as regional and local climatic conditions varied.

Thirteen natural populations persist; nine of these are in Mexico. Approximately 20 transplanted populations exist in the wild (U.S. Fish and Wildlife Service 1993), though this number fluctuates widely due to climatic variation and the establishment (and failure) of refugium populations (Moyle 2002). Many natural and transplanted populations are imperiled by one or more threats. Threats to the species include loss and degradation of habitat through groundwater pumping or diversion, contamination of agricultural return flows, predation, and competition from nonnative fish species, populations outside of historical range, populations of questionable genetic purity, restricted range, small populations, and environmental contaminants (U.S. Fish And Wildlife Service 1986, Moyle 2002).

Aspects of the natural history and habitat of desert pupfish in Arizona are similar to those of the Gila topminnow. In Arizona, desert pupfish and Gila topminnow were historically known from similar habitats, though the former was not as widespread, and the two species are managed together by the AGFD (Weedman and Young 1997, Voeltz and Bettaso 2003). The primary difference in life history between these fish is that desert pupfish lay eggs and Gila topminnows are live-bearers.

Our information indicates that, rangewide, more than 60 formal and informal consultations have been completed or are underway for actions affecting desert pupfish. The majority of these opinions concerned the effects of grazing (approximately 11 percent), roads and bridges (approximately 1 percent), agency planning (approximately 15 percent), or recovery (approximately 25 percent). The remaining 47 percent of consultations dealt with timber harvest, fire, flooding, recreation, realty, animal stocking, water development, recovery, and water quality issues.

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 Porter Wash Pond is a small (20 foot X 20 foot) aquatic habitat located near the Gila River. Seepage from Porter wash spring provides suitable habitat conditions for a variety of plant species including sedges that surround the Porter Wash Pond. Adjacent wetted soils support Yerba mansa (*Anemopsis californica*) and spikesedges (*Eleocharis spp*.); whereas the uplands are dominated by large mesquite trees (*Prosopis spp*.) and other Sonoran desert vegetation.

The 423-acre fenced Sands Draw Exclosure is in the San Simon Valley. Recent management actions within the Sands Draw Exclosure focused on aquatic, riparian, and terrestrial habitat creation, restoration, and enhancement to benefit wildlife. These actions included 1) pond, pool, and stream channel development, 2) new exclosure fencing, 3) salt cedar removal, and 4) seeding and planting of native vegetation.

A. STATUS OF THE SPECIES WITHIN THE ACTION AREA

Gila Topminnow, Desert Pupfish, and Gila Chub

No populations of any of three species are currently known in the action areas. Historically, these species may have existed in the San Simon River when flows were more consistent, and existed in the Gila River before nonnative aquatic species were established. Although neither species likely occurs in the action areas at present, both are scheduled to be introduced into both sites in the near future. Critical habitat for Gila chub or desert pupfish does not occur in the action area.

B. FACTORS AFFECTING SPECIES ENVIRONMENT WITHIN THE ACTION AREA

Gila Topminnow, Desert Pupfish, and Gila Chub

Other actions that occur in the action areas include livestock grazing on private and state trust lands, recreation (e.g., hunting, possibly bird watching), water withdrawal, and farming. All these actions do not impact the resources of the Porter Wash Pond or Sands Draw Exclosure because these actions occur downstream of the sites.

American bullfrogs (*Lithobates catesbeiana*) have been documented in Porter Wash Pond with source populations 0.6 miles away along the Gila River. American bullfrogs have been documented in Sands Draw Wildlife Exclosure, and are found less than five miles south. Bullfrogs, common throughout out southeastern Arizona are voracious predators and will eat just about anything that they can swallow. Bullfrogs have not been implicated in the direct demise of native fish populations, however, predation of native fish will likely occur, but should not be of the amount or level to affect the establishment and long-term survival of Gila chub, desert pupfish, or Gila topminnow. In an effort to limit bullfrog presence at the sites, bullfrogs may be removed by dip-netting, hand capture, seine netting, electroshocking, and/or land and water traps. These actions are not anticipated to have any long-term effects on bullfrog presence because of the source populations that are near the sites.

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, which 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.

Gila Topminnow, Desert Pupfish, and Gila Chub

Livestock Grazing

No livestock use within the exclosures will be permitted, but livestock trespass is possible if a gate is left open, if a fence is damaged and knocked down during a weather event, or from livestock rubbing and/or pushing against the fence. If livestock trespass occurs, livestock could trample and ingest fish eggs and larvae, or injure or kill eggs or larvae by stepping on them (Roberts and White, 1992). Livestock grazing and trampling can affect fish by altering the shape and form of the aquatic habitat, riparian soils and vegetation composition, density, and structure; and by altering water quality, quantity, and flow patterns (Kauffman and Krueger 1984, Fleischner 1994, Trimble and Mendel 1995, Belsky *et al.* 1999). If livestock trespass into the exclosures they would graze the aquatic and riparian plants and trample the vegetation and soil. Trespass livestock can also impair water quality. Cattle waste products can deteriorate water quality resulting in alteration of fish communities or fish kills. The impact generally comes from increased levels of ammonia (NH_3) and Nitrite (NO_2) and decreased levels of dissolved oxygen (O_2) (Taylor *et al*. 1991, Cross 1971). The effects of this type of pollution are increased under conditions of limited water supply such as in small ponds and springs. Sedimentation from erosion caused by livestock can impair spawning areas and reduce aquatic productivity, which can affect food

production (Ward 1992, Meehan 1991). All of these actions could harm fish or their habitat that are in the ponds. However, the exclosures at the Porter Wash Pond and the Sands Draw Exclosure should preclude or minimize these effects, so that injury, mortality, and effects to habitat would not occur or be minimal, not measurable, and would not affect the population levels at the sites.

Wetlands can also be affected by grazing in the watershed. Effects of cattle grazing on watersheds include alterations of vegetation communities, increased soil erosion and runoff, decreased infiltration rates, damage to cryptobiotic crusts, and increased soil compaction. Degradation of watersheds can cause downcutting, loss of perennial flow, loss of riparian vegetation, increased sedimentation, and higher peak flows in streams and rivers fed by degraded watersheds. We anticipate that livestock management (including adjacent to the Sands Draw Exclosure which could be authorized in the future) will not result in measurable watershed effects to the sites because the allotments will be managed to maintain or improve rangeland condition, including soil stability and vegetation. See our 1997 biological opinion on the effects of the Safford/Tucson livestock grazing program for further information about effects of ongoing grazing.

Recreation

Recreational activities (*e.g.* hunting, bird watching, rock collecting) do not occur at or near the Porter Wash Pond due to its remoteness and existing habitat characteristics (e.g., dense vegetation and vegetation with spines). Recreational activities such as hunting, bird watching, and/or camping within the Sands Draw Exclosure are limited or non-existent due to lack of public awareness and remoteness of area. Recreational activities, in general, occurring near or in aquatic habitat have the potential to erode banks and damage spawning habitats; however, this has not occurred in the past and is not anticipated in the foreseeable future due to remoteness of the sites and little to no visitor traffic. The level of disturbance from the above-mentioned recreational activities is not likely to reach proportions leading either directly or indirectly to Gila chub, desert pupfish, or Gila topminnow injury, mortality, or changes in habitat.

Salt Cedar Removal And Control

1. Herbicide Treatment

Habitat® has low toxicity to fish and invertebrates. Because Habitat® will only be applied directly to salt cedar stumps at the Sands Draw Exclosure, mobility of the herbicides through soil is unlikely to occur to the extent that it will reach the water and affect the fish. Additionally, herbicide treatments are not implemented if winds are over 10 miles per hour. This reduces the potential of airborne particulates from the herbicide entering the aquatic habitat at the Sands Draw Exclosure. Even though the likelihood of herbicides entering the aquatic habitat is remote, vegetation buffers are currently being developed to capture and retain sediments and pollutants that could enter the aquatic habitats and affect water quality, aquatic/riparian vegetation, and any aquatic organisms present. The likelihood of chemical treatments resulting in harm to the species at the Sands Draw Exclosure is low because treatments will be applied directly to salt cedar, vegetation buffers will be developed around the water to capture and retain sediment and pollutants, and herbicide will not be used if wind speeds exceed 10 miles per hour.

2. Mechanical Treatment

No salt cedar is located at or near the aquatic habitats at the Porter Wash Pond or the Sands Draw Exclosure at present, so mechanical treatments in the immediate future will not adversely affect water quality, aquatic/riparian vegetation, or any aquatic organisms (*i.e*., fish and frogs). Mechanical treatments may be used to remove salt cedar that establish in the future at or near the aquatic habitats. Fish eggs and larvae, which are largely undetected by the human eye, may be killed while removing salt cedars. To minimize injury and/or mortality, vegetation will be gently moved up and down through the water column and then checked for eggs and fish prior to removal. It is anticipated that adult fish will shy away from these actions occurring near or in the aquatic habitat and avoid injury or death. However, during the breeding season, adult male desert pupfish become territorial and may resist vacating their nest. To reduce injury/mortality no treatment activities will be conducted during the primary breeding season, which occurs when water temperatures are greater than 68^{o} F (20^{o} C) (U.S. Fish And Wildlife Service 1993). Because of these reasons, we anticipate that no or few eggs or larvae would be killed or injured in implementing the proposed action.

Pond Maintenance

The aquatic and riparian habitats at the Porter Wash Pond and the Sands Draw Exclosure will require routine maintenance to maintain open water habitat and vegetation enhancements for native fish. To prevent the spread of invasive aquatic weeds such as cattails, mechanical harvesting (cutting, digging, and/or pulling) by hand will occur as needed and at a minimum bi-annually. Fish eggs and larvae, which are largely undetected by the human eye, may be killed while harvesting vegetation. To minimize injury and/or mortality, vegetation will be gently moved up and down through the water column and then checked for eggs and fish prior to removal. It is anticipated that adult desert pupfish, Gila topminnow, and Gila chub will shy away from maintenance activities located near or in the aquatic habitat and avoid injury or death. However, during the breeding season, adult male desert pupfish become territorial and may resist vacating their nest. To reduce injury/mortality no maintenance activities will be conducted during the primary breeding season, which occurs when water temperatures are greater than 20^{o} C (U.S. Fish And Wildlife Service 1993).

Sediment build-up within the ponds will be reduced with the exclusion of livestock and existing native grasses, forbs, shrubs, and trees in the riparian and upland transition zone will also capture and retain sediment. The vegetative buffers will protect and support the pond banks, filter out pollutants, capture and retain sediments, and will slow the flow of runoff into the aquatic habitat. Although sedimentation will be reduced with vegetation buffers, sedimentation buildup is inevitable in lotic systems. Removal will focus on areas that are no longer inundated by water and no longer providing habitat for fish. Fish or eggs may incidentally be killed or harmed from excavating the pond. To reduce fish mortality during sediment removal, only small sections will be excavated at any one time. A maximum of 25% of the original pond size will be excavated as required to maintain habitat for fish populations and removal will not occur during the primary breeding season.

Pond maintenance, while possibly injuring or killing a few eggs or fish, will maintain the habitat for the species in the long-term, and not affect the long-term populations at the sites.

Critical Habitat

Critical habitat for Gila chub or desert pupfish does not occur within the action area, so none will be affects by the proposed action.

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.

Many activities without a Federal nexus occur and are expected to continue to occur in the action area and vicinity of the Porter Wash Pond and Sands Draw Exclosure. Agricultural activities, such as farming and livestock grazing, occur on private and state lands. Groundwater pumping, surface water diversions, agricultural return flows, and flood control activities are present downstream of the project sites. These actions in the action areas are not anticipated to have any effect to the fish stocked in the proposed sites.

CONCLUSION

Gila Chub, Gila Topminnow, and Desert Pupfish

After reviewing the current status of the Gila chub, Gila topminnow, and desert pupfish, the environmental baseline for the action area, the effects of ongoing management activities, and the cumulative effects, it is our biological opinion that the continuing actions and site maintenance at the Porter Wash Pond and the Sands Draw Exclosure, as proposed, are not likely to jeopardize the continued existence of the Gila chub, Gila topminnow, or desert pupfish once they are established. No critical habitat is designated for Gila topminnow and there is no critical habitat for the Gila chub or desert pupfish within the action area; therefore, none will be affected. We base this conclusion on the following:

1. The effects of the continuing and future actions, including the conservation measures, are unlikely to harm the species, or, if harm is likely, it is unlikely to result in the long-term reductions of the species from either site.
2. The current status of Gila chub, Gila topminnow, and desert pupfish is poor and declining. Although short-term impacts are anticipated, pond maintenance will enhance the long-term likelihood of survival of these species at the wells, and contribute to recovery.
3. We anticipate few effects from livestock because livestock are excluded from the Porter Wash Pond and the Sands Draw Exclosure, which will minimize any trespass livestock use.
4. Recreation is minimal with no discernable impacts to fish habitat.

The conclusions of the 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 are 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 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 measure described below is non-discretionary, and must be undertaken by you so that it becomes binding conditions of any grant or permit issued to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. You have a continuing duty to regulate the activity covered by this incidental take statement. If you (1) fail to assume and implement the terms and conditions or (2) fail to require the (applicant) 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, you must report the progress of the action and its impact on the species to us as specified in the incidental take statement. [50 CFR §402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

Gila chub, Gila topminnow, and desert pupfish

The only reasonably certain incidental take to occur as a result of continuing and future actions in proximity to the proposed fish reintroductions would be from pond maintenance. The incidental take is expected to be in the form of direct mortality, harm, and harassment. Take in the form of direct mortality could occur from excavating that could kill fish or eggs, and from removing vegetation that could kill eggs. Take in the form of harm could occur due to short-term changes in fish habitat from excavating and vegetation removal that are likely to cause death or injury of eggs. Take in the form of harassment could also occur from disturbance of fish or their habitat by excavating and vegetation removal associated with pond maintenance. We anticipate that any take that occurs will be at levels below that which would result in extirpation of either species from either site. We anticipate that incidental take will be difficult to detect as these species have a small body size, finding a dead or impaired specimen is unlikely, losses may be masked by seasonal fluctuations in numbers from other causes, scavenging of dead animals is likely to occur, and other reasons. We will consider incidental take to be exceeded if the following occurs:

> Gila chub, Gila topminnow, and desert pupfish monitoring shows an effect or effects to the populations or their habitat attributable to the proposed action that results in the extirpation of any species from the Porter Wash Pond or the Sands Draw Exclosure.

EFFECT OF THE TAKE

In this biological opinion, we determined that this level of anticipated take is not likely to result in jeopardy of the Gila chub, Gila topminnow, or desert pupfish. The implementation of the proposed action, along with the conservation measures, will ensure that, while incidental take may still occur, it is minimized to the extent that habitat quality and quantity will be maintained in the planning area and species will be conserved.

REASONABLE AND PRUDENT MEASURE AND TERMS AND CONDITIONS

Due to the conservation measures that are part of the proposed action, no reasonable or prudent measures are necessary to further minimize incidental take. However, to adequately assess the effectiveness of the conservation measures in minimizing incidental take, you shall monitor the species and actions and report to us the finding of that monitoring. You shall submit a report to the Arizona Ecological Services Office within one year after stocking begins, and annually as long as monitoring occurs. This report will briefly document the portions of the proposed actions that have been implemented, the effectiveness of the conservation measures, status of the species in each stocked well, and, if any fish are found dead, the suspected cause of mortality. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information, and you must immediately provide an explanation of the causes of the taking and review with us the need for the possible provision of reasonable and prudent measure(s), or reinitiation of consultation.

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 you work with AGFD to verify presence or absence of nonnative aquatic species on all BLM lands in the San Simon watershed. If nonnative aquatic species are found, we recommend that you work with AGFD and our office to develop a plan or outline to remove nonnative aquatic species from the BLM lands in this watershed.

2. We recommend that you coordinate with AGFD and our office in efforts to work with private landowners to renovate any source populations of nonnative aquatic species from their lands in the Gila River and San Simon watershed.

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

REINITIATION NOTICE

This concludes formal consultation on the action(s) outlined in the request. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We appreciate your efforts to identify and minimize effects to listed species from this project. For further information please contact Mark Crites (520) 670-6150 (x229) or Scott Richardson (520) 670-6150 (x242). Please refer to the consultation numbers, 22410-2010-F-0396 or 22410-2011-F-0113, in future correspondence concerning these projects.

/ s / Scott Richardson for
Steven L. Spangle

cc (hard copy):
Field Supervisor, Fish and Wildlife Service, Phoenix, AZ (2)
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ
State Director, Bureau of Land Management, Phoenix, AZ

cc (electronic copy):
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ

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Figure 1. Porter Wash Pond.

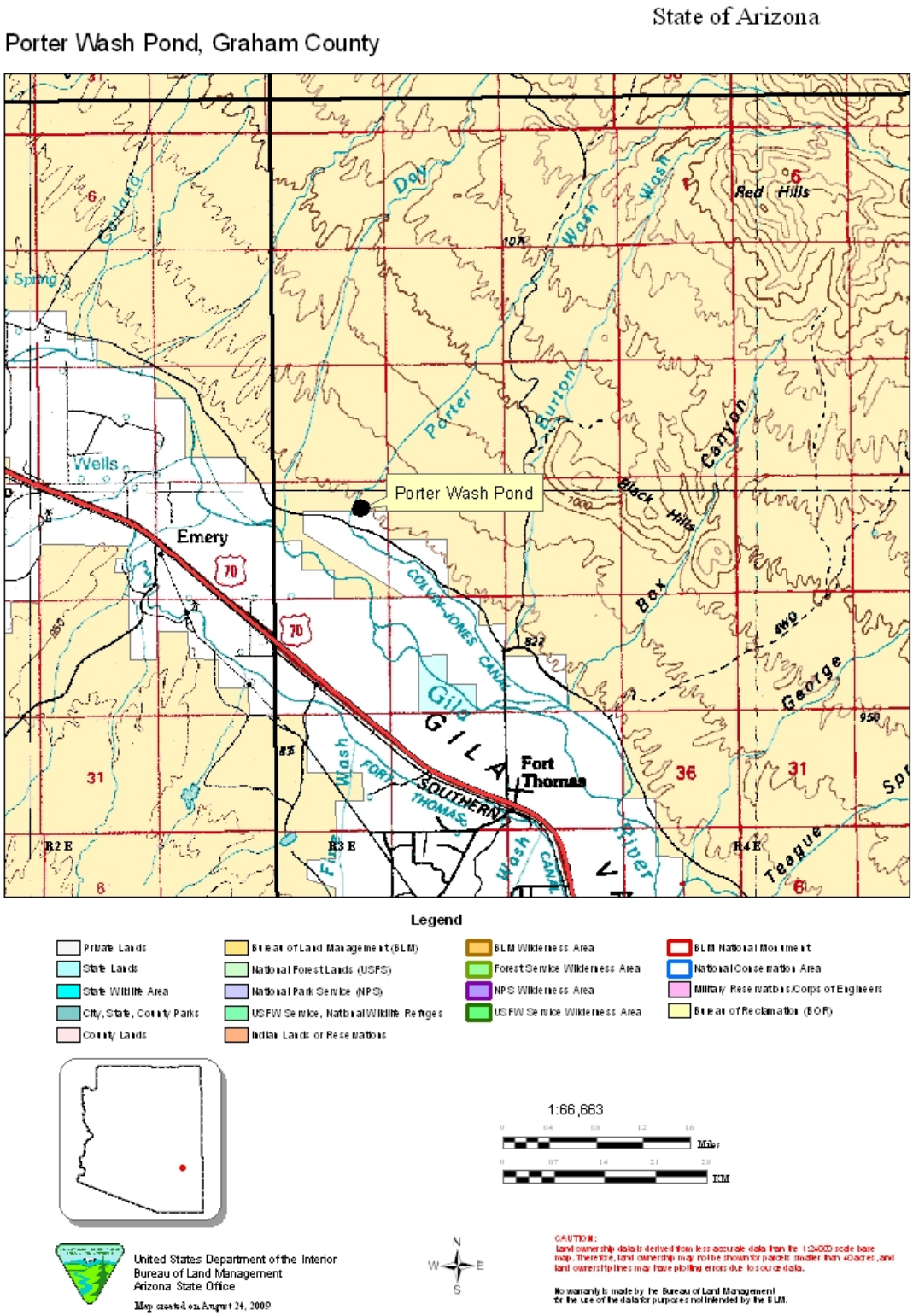

Figure 2. Sands Draw Wildlife Exclosure.