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Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (Service) on a permit (Corps Action No. SPA-2012-13-LCO) for the New Mexico Department of Transportation (NMDOT) (Applicant) under section 404 of the Clean Water Act. We received your email on January 3, 2012, with a Biological Assessment (BA) evaluating the effects of excavating accumulated alluvial sediments at the United States Highway 180 (US 180) Bridge across Whitewater Creek, Glenwood, Catron County, New Mexico (Project) on the endangered loach minnow (*Tiaroga cobitis*), and its designated critical habitat. You determined that the Project "may affect, and is likely to adversely affect" the loach minnow. In addition, you determined that the Project "may affect, but is not likely to adversely affect" the endangered southwestern willow flycatcher (*Empidonax traillii extimus*), and requested concurrence. We concur with this determination based on the following reasons:

Southwestern willow flycatcher

The southwestern willow flycatcher uses dense riparian vegetation for nesting in the San Francisco River watershed where the Project is located (Service 2011). No southwestern willow flycatchers were found in the Project area during previous surveys (2004), though suitable habitat does occur in the area. Vegetation clearing is proposed to be completed outside the May to September breeding season, and any work during the breeding season will be preceded by a survey using the 2010 protocol.

The NMDOT has also incorporated specific conservation measures to ensure that any effects from the action will be insignificant or discountable. For these reasons, we concur that the Project "may affect, is not likely to adversely affect" the southwestern willow flycatcher. This concludes consultation on the southwestern willow flycatcher.

We concur with your determination for the loach minnow, and provide this biological opinion (BO) in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.) (Act).

Also note that this biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of designated critical habitat from 50 Code of Federal Regulations (CFR) 402.02. Instead, we have relied upon the statute and the August 6, 2004, Ninth Circuit Court of Appeals decision in *Gifford Pinchot Task Force versus U.S. Fish and Wildlife Service* (Case No. 03-35279) to complete our analyses with respect to designated critical habitat.

Consultation History

On March 24, 2010, the Service made a site visit with the Corps and NMDOT to review the site and proposed work. On February 8, 2011, we received a draft BA via email. On March 2, 2011, we provide comments on the draft BA. We received your revised BA on January 3, 2012. We determined that the information in the BA was sufficient and adequate to complete formal consultation and initiated formal consultation on February 1, 2012. This BO is based on information provided in the BA, subsequent email and telephone conversations between our staff, and data in our files. A complete administrative record of this consultation is on file at this office.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is located on Whitewater Creek, a tributary of the San Francisco River, in Glenwood, Catron County, New Mexico. The US 180 Whitewater Creek Bridge is located at latitude 33.3164 and longitude -108.8825 (North American Datum of 1983). The bridge and creek bottom are on private lands with an access easement to NMDOT. The action area for the project extends onto private property that the NMDOT has obtain written permission to access.

NMDOT proposes to remove accumulated sediment from within the channel at the bridge, and for 48 meters (m) (158 feet [ft]) upstream and 138 m (452 ft) downstream from the bridge. Sediment will be removed to allow for 2.7 m (9 ft) of clearance between the bottom of the bridge deck and the channel bottom below (i.e., the clearance required to pass a 100-year flow event) and to establish a channel that is 15 m (50 ft) wide at the channel bottom upstream and downstream from the bridge to protect the bridge and adjacent landowners from flooding due to reduced channel capacity. The NMDOT proposes to conduct the initial work during February/March 2012, during low-flow conditions. The NMDOT would conduct a follow-up bridge inspection during November or December of 2012 to determine if additional sediment removal is required the following late winter/early spring runoff. If additional maintenance is warranted based on the bridge inspection, the NMDOT would conduct the follow-up sediment removal in late winter through 2017. This proposed schedule of early winter bridge inspections followed by late winter maintenance (if warranted) would maintain the above channel dimensions.

The initial proposed maintenance activity would take approximately 17 days to complete (6 hour days). Subsequent maintenance activities would likely be shorter in duration. Excavation would be conducted using a rubber-tired loader, backhoe, bobcat, and hand tools. Due to encroachment, about 0.06 ha (0.14 acres) of riparian habitat, primarily willows (*Salix* spp.) and young cottonwoods (*Populus deltoides wislizenii*) will need to be removed. All excavated sediment would be hauled away from the site to an existing (upland) stockpile location on US 180 at milepost 55.8 (latitude 33.259 and longitude -108.872).

Direct effects of the Project consist of disturbance of the stream bottom and suspension of fine sediments along a stream length of 186 m (610 ft) and channel width of 12.6 m (41.5 ft) for a total area of 0.24 hectares (ha) (0.58 acres). The disturbance includes removal of the encroaching riparian area to restore the channel to the configuration when the bridge was built. Indirect effects of the Project include potential impacts from impaired water quality up to 107 m (350 ft) downstream of the Project area where the wetted channel width is expected to be no more than 2.4 m (8 ft) at low-flow conditions. This will result in temporary effects to an additional 0.03 ha (0.06 acres) of designated critical habitat. No impacts are expected at the stockpile area as a previously disturbed area is being used.

Fish and amphibians will be salvaged from the Project area and translocated downstream. This will be accomplished by enclosing the Project area with block nets at the upstream and downstream ends and then capturing fish and amphibians in the work area using multiple-pass electrofishing and seining. All fish captured would be relocated downstream of the Project area. The block nets would remain in place during project implementation to prevent fish from reentering the work area. In addition, NMDOT will perform riparian restoration to include the planting of 0.06 ha (0.14 acres) of willow (*Salix* spp.) to stabilize both banks.

Conservation measures

Conservation measures proposed by the applicant include:

1) all work will be conducted during low-flow conditions;

2) all work will be planned before April or after June, outside of the spawning period of loach minnow, if work is not completed by April due to high-flow conditions the work can be resumed as soon as low-flow conditions return;

3) a block net will be installed upstream and downstream of the Project area during excavation to exclude fish and amphibians; fish and amphibians will be salvaged from the Project area and translocated downstream, outside the action area;

4) before removal of riparian vegetation during the bird breeding season (April to September) a nesting bird survey will be conducted. All nests with eggs or young will be avoided until the young have fledged;

5) minimize in-water activity by diverting the flow around the work area within the floodplain;

6) place two rows of straw bales across the wetted stream channel to form a water permeable sediment trap;

7) spill response materials, such as booms and absorbent pads, will be available on site at all times during the Project;

8) all spills will be reported to appropriate agencies; all fuels, lubricants, equipment, and other materials that may contaminate surface water will be stored outside of the 100-year floodplain;

9) to prevent the introduction of invasive species seeds, all earthmoving and hauling equipment will be washed prior to entering the Project area;

10) to prevent invasive species seeds from leaving the site, all construction equipment will be inspected and all attached plant/vegetation and soil/mud debris removed prior to leaving the Project area;

11) heavy equipment used in the stream will be steam cleaned to remove petroleum products (oil, grease, and hydraulic fluids) before being used in the Project area, to reduce the potential for adverse effects from petroleum products in the stream; and

12) the Project will adhere to all terms and conditions under the Clean Water Act, such as the U.S. Army Corps of Engineers 404 permit and the 401 water quality certification from the New Mexico Environment Department.

STATUS OF THE SPECIES AND CRITICAL HABITAT (rangewide)

Loach minnow (*Tiaroga cobitis*)

Status of the species/critical habitat

The loach minnow was listed as a threatened species on October 28, 1986, based on the reduction of its range and numbers due to habitat destruction and competition with nonnative fish species (Service 1986). The Service found that a petition to reclassify the species to endangered status was warranted; however, reclassification was precluded due to work on other higher priority listing actions (Service 1994b). The need for reclassification is based on threats to a large portion of its habitat. On February 23, 2012, the loach minnow was reclassified as endangered (Service 2012). The species is listed as threatened (recommended to be uplisted to endangered) by the State of New Mexico (New Mexico Department of Game and Fish [NMDGF] 2008) and a Wildlife of Special Concern in Arizona (Arizona Game and Fish Department 1996). The Service published the Loach Minnow Recovery Plan in 1991 (Service 1991).

The Service designated critical habitat for loach minnow in 1994, which included portions of the San Francisco, Tularosa, and upper Gila Rivers, Aravaipa Creek, and the Blue River from Campbell and Dry Blue Creeks downstream to the confluence with the San Francisco River (Service 1994a). Critical habitat for the loach minnow was set aside by the New Mexico District Court (*Coalition of Arizona-New Mexico Counties for Stable Economic Growth vs. U.S. Fish and Wildlife Service*, No. 95-1285-M Civil D.N.M., filed March 4, 1997). The court cited the

Service's failure to analyze the effects of critical habitat designation under the National Environmental Policy Act as the basis for its ruling. Critical habitat was revoked by the Service on March 25, 1998 (Service 1998). The Service published a new critical habitat proposal in the Federal Register on December 10, 1999 (Service 1999), and a final rule was published on April 25, 2000 (Service 2000). On June 1, 2004, the United States District Court for the District of New Mexico ruled that critical habitat for loach minnow was vacated. Critical habitat was proposed again in 2005 and designated on March 21, 2007 (Service 2007). Following a legal challenge to that designation, the Service filed a motion for voluntary remand and is currently reevaluating critical habitat. However, those areas designated as critical habitat in the 2007 rule remain in place until a new designation can be finalized. In 2010, the Service proposed revised critical habitat for the loach minnow and proposed to change its status from threatened to endangered due to the habitat loss and modifications caused by historical and ongoing land uses such as water diversion and pumping, livestock grazing, and road construction; competition with, or predation by, nonnative species; the inadequacy of existing regulatory mechanisms; and climate change induced reductions in available resources (75 FR 66482, Service 2010). On October 4, 2011, the comment period was reopened and the availability of a draft economic analysis (DEA) and draft environmental assessment (EA) on the proposed designation of critical habitat for the loach minnow, and an amended determination section revising proposed critical habitat units 6 (San Francisco River Subbasin) and 8 (Gila River Subbasin) was announced (76 FR 61330, Service 2011). The revised designated critical habitat was finalized on February 23, 2012, and the loach minnow designated as endangered (77 FR 10810, Service 2012)

Species Description

The loach minnow is a small, slender, elongate fish of the family Cyprinidae rarely exceeding 60 mm (2.4 in) in length (Minckley 1973). Loach minnow have upward-directed eyes and a terminal mouth with no barbels. Loach minnow have an olivaceous coloration that is highly blotched with darker pigment. Whitish spots are present at the origin and insertion of the dorsal fin as well as the dorsal and ventral portions of the caudal fin base. Breeding males develop bright red-orange coloration at the bases of the paired fins, on adjacent fins, on the base of the caudal opening, and often on the abdomen. Breeding females become yellowish on their fins and lower body (Minckley 1973).

Life history and habitat description

Loach minnow is found in turbulent, rocky riffles of streams up to about 2,200 m (7,200 ft) in elevation. Loach minnow are bottom-dwelling inhabitants of shallow, swift waters flowing over gravel, cobble, and rubble substrates in mainstream rivers and tributaries (Rinne 1989; Propst and Bestgen 1991). In addition, the species is very habitat specific, only inhabiting riffles; this limited habitat is vulnerable to the adverse effects of sedimentation. These factors make the loach minnow very sensitive to environmental changes and disturbances. Loach minnow use the spaces between, and in the lee of, larger substrates for resting, sheltering, feeding, and spawning (Propst et al. 1988; Rinne 1989). The species is rare or absent from habitats where fine sediments fill interstitial spaces (Propst and Bestgen 1991).

Most growth occurs during the first summer. Longevity is typically 15 months to 2 years, although loach minnow can live as long as 3 years (Britt 1982; Propst et al. 1988; Propst and Bestgen 1991). The first spawn generally occurs in their second year, primarily during March through May (Britt 1982; Propst et al. 1988), however, under certain circumstances, loach minnow also spawn in the autumn (Vives and Minckley 1990). Miller (1998) reports loach minnow males in New Mexico were in breeding coloration in late June.

Spawning occurs in the same riffles occupied by adults during the nonspawning season. Sex ratios appear approximately equal (Service 1991). The adhesive eggs of the loach minnow are attached to the undersurface of the downstream side of a rock that forms the roof of a small cavity in the substrate. Rocks used for spawning are flattened and slightly elevated from the stream bottom on the downstream side and are nearly always fine-grained, basalt-type material with smooth surfaces; coarse-grained stones with pocked or rough surfaces are not used for ova deposition (Propst and Bestgen 1991). To be suitable for loach minnow spawning, cobbles need to be anchored in the substrate. The number of eggs deposited per rock ranges from 4 to 260, with reported means of 52 (Propst and Bestgen 1991) and 63 (Britt 1982). Fecundity of females ranges from about 150 to 250 mature ova, and generally increases with increasing body size (Service 1991). Eggs incubated at 18 to 20 °C (64.4 to 68 °F) hatched in 5 to 6 days (Propst et al. 1988). Limited data indicate that the male loach minnow may guard the nest during incubation (Propst et al. 1988; Vives and Minckley 1990). Embryos are found on rocks 3 to 5 by 10 to 18 cm (1 to 2 by 4 to 7 in) located in riffles (Britt 1982; Propst and Bestgen 1991).

Loach minnow feed exclusively on aquatic insects (Britt 1982; Abarca 1987). Loach minnow are opportunistic benthic insectivores, feeding primarily on riffle-dwelling larval mayflies, black flies, and chironomids. They actively seek their food among bottom substrates, rather than pursuing food items in the drift.

Population dynamics

The loach minnow has low population density, short life expectancy, and low fecundity. Even in optimal habitat, loach minnow populations are not dense; Propst and Bestgen (1991) reported that estimated densities in optimal riffle habitat ranged from 1.65 per m^2 (0.15 per ft^2) to less than 0.5 per m^2 (0.04 per ft^2).

Population status and distribution

The loach minnow is endemic to the Gila River basin of Arizona and New Mexico and Sonora, Mexico. In Arizona, the loach minnow occupied as many as 2,250 km (1,400 mi) of stream length, but it is now found in less than 10 percent of that range and is generally rare to uncommon (Service 2011). Present populations are geographically isolated and inhabit upstream areas of their historical range, which included the basins of the Verde, Salt, San Pedro, San Francisco, and Gila Rivers (Minckley 1973; Sublette et al. 1990). The species is believed to be extirpated from Mexico. In New Mexico, the loach minnow was historically found throughout warmwater reaches of the San Francisco and Gila Rivers and their major tributaries (Propst et al. 1988). The species has become very rare in substantial portions of its remaining range in New Mexico, and now occupies only fragmented reaches of the San Francisco and Gila drainages

(Propst et al. 1988). The loach minnow is currently moderately common in less than 10 km (6.2 mi) of the Tularosa and San Francisco Rivers (Paroz and Propst 2007). In the lower reaches of the West Fork Gila River, a small population persists (Paroz et al. 2009) and the population in the Gila-Cliff Valley has declined considerably in the past 15 years (Paroz et al. 2006). Elsewhere in the Gila-San Francisco drainage, loach minnow occurs irregularly or is absent (Paroz et al. 2006; Paroz and Propst 2007). The loach minnow is one of the rarest of the remaining five species of native fishes inhabiting the Gila River and its tributaries (Paroz et al. 2006).

Biochemical investigations on this species indicates that there are substantial differences in genetic makeup between the remnant loach minnow populations that occupy isolated fragments of the Gila River basin, indicating a geographic component to the population structure of the species (Tibbets and Dowling 1996). Therefore, protection of isolated loach minnow populations is important to preserve genetic variation.

During the last century, loss of habitat, competition and predation by nonnative aquatic species have reduced the historical range of the loach minnow by about 85 percent (Miller 1961; Hendrickson and Minckley 1984; Williams et al. 1985; Service 1986; Marsh et al. 1989; Service 1994a). Both historical and present landscapes surrounding loach minnow habitats have been impacted to varying degrees by livestock grazing, mining, agriculture, timber harvest, wildfire, recreation, development, or impoundments (Hendrickson and Minckley 1984; Belsky et al. 1999). Land and water use practices have impaired perennial flows and natural hydrographs (Minckley and Meffe 1987). These activities can degrade loach minnow habitats by altering flow regimes, increasing watershed and channel erosion, contributing to increased sedimentation, and adding contaminants to streams and rivers (Belsky et al. 1999). Alteration of the natural flooding characteristic of desert streams has degraded habitat and increased competition from introduced nonnative species (Minckley and Meffe 1987). As a result, these activities may affect loach minnow through direct mortality, interference with reproduction and predator avoidance, and reduction of invertebrate food supplies.

Nonnative aquatic species (fishes, bullfrogs, and crayfish) are a threat to loach minnow as they are for most native aquatic fishes. Of the 40 species and subspecies of fish that have gone extinct in North America, the detrimental effects of introduced species were cited in 68 percent of the extinctions (Miller et al. 1989). Red shiners (*Cyprinella lutrensis*) compete with loach minnow for food and habitat and are very tolerant of the extreme conditions found in desert streams (Matthews and Hill 1977). Nonnative fish such as channel catfish catfish (*Ictalurus punctatus*) and flathead catfish (*Pylodictis olivaris*) frequent riffles occupied by loach minnow, especially at night when catfish move onto riffles to feed and may prey on loach minnow (Propst 1999). In addition, largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieu*), green sunfish (*Lepomis cyanellus*), introduced trout, and bullfrogs may prey on loach minnow.

Past changes in the range and population density of loach minnow undoubtedly occurred in response to natural spatial and temporal variations in the environment, but its current status is the result of human activities (Service 2010). Much of the Upper Gila River basin is in a degraded condition with poor riparian habitats, incised channels, poor bank stability, and high streambed embeddedness due to water diversion and pumping, livestock grazing, and road construction (Service 2010).

Loach Minnow - Designated Critical Habitat

The designated critical habitat for loach minnow is separated into eight subbasins, which were based on specific areas within the geographical area occupied by the species at the time it was listed on which are found those physical and biological features (PBFs) that are essential to the conservation of the species (such as space, food, cover, and protected habitat). These subbasins include the Verde River, Salt River, San Pedro River, Bonita Creek, Eagle Creek, San Francisco, Blue River, and Gila River Subbasins. The term PBFs replaces the term primary constituent elements used in previous rules to describe the habitat characteristics essential to the conservation of the species that may require special management considerations or protection. Designations were based on sufficient PBFs being present to support one or more the species' life history functions. The PBFs of critical habitat designated for loach minnow are as follows (Service 2012):

1. Habitat to support all egg, larval, juvenile, and adult loach minnow. This habitat includes perennial flows with a stream depth generally less than 1 m (3.3 ft), and with slow to swift flow velocities between 0 and 80 cm per second (0.0 and 31.5 inches per second). Appropriate microhabitat types include pools, runs, riffles, and rapids over sand, gravel, cobble, and rubble substrates with low or moderate amounts of fine sediment and substrate embeddedness. Appropriate habitats have a low stream gradient of less than approximately 2.5 percent, are at elevations below 2,500 m (8,202 ft). Water temperatures should be in the general range of 8.0 to 25.0 °C (46.4 to 77.0 °F);
2. An abundant aquatic insect food base consisting of mayflies, true flies, black flies, caddisflies, stoneflies and dragonflies;
3. Streams with no or no more than low levels of pollutants;
4. Perennial flows or interrupted stream courses that are periodically dewatered but that serve as connective corridors between occupied or seasonally occupied habitat and through which the species may move when the habitat is wetted;
5. No nonnative aquatic species, or levels of nonnative aquatic species that are sufficiently low as to allow persistence of loach minnow; and
6. Streams with a natural, unregulated flow regime that allows for periodic flooding or, if flows are modified or regulated, a flow regime that allows for adequate river functions, such as flows capable of transporting sediments.

Currently, there are approximately 981 km (610 mi) of designated critical habitat within the loach minnow range. Refer to Service (2012) for more specific information on the loach minnow PBFs and designated critical habitat.

Climate Change

General climate change effects on federally listed species are described in the Environmental Baseline. Here we describe factors that might affect the loach minnow.

The New Mexico Office of the State Engineer report (2006) made the following observations about the impact of climate change in New Mexico:

1. warming trends in the Southwest exceed global averages by about 50 percent;
2. modeling suggests that even moderate increases in precipitation would not offset the negative impacts to the water supply caused by increased temperature;
3. temperature increases in the Southwest are predicted to continue to be greater than the global average;
4. there will be a delay in the arrival of snow and acceleration of spring snow melt, leading to a rapid and earlier seasonal runoff; and
5. the intensity, frequency, and duration of drought may increase.

Consistent with the outlook presented for New Mexico, Hoerling and Eischeid (2007) states that, relative to 1990 through 2005, simulations indicate that a 25 percent decline in streamflow will occur from 2006 through 2030 and a 45 percent decline will occur from 2035 through 2060 in the Southwest. Seager et al. (2007) show that there is a broad consensus among climate models that the Southwest will get drier in the 21st century and that the transition to a more arid climate is already under way. Only 1 of 19 models has a trend toward a wetter climate in the Southwest (Seager et al. 2007).

Enquist et al. (2008) found that 93 percent of New Mexico's watersheds have become relatively drier from 1970 to 2006 and that snowpack in New Mexico's major mountain ranges has declined over the past 2 decades in 98 percent of the sites analyzed. The timing of peak streamflow from snowmelt in New Mexico is an average of 1 week earlier than in the mid-20th century (Enquist et al. 2008). Watersheds with the greatest declines in snowpack are those that have experienced the greatest drying from 1970 to 2006. Increased winter temperatures can cause more precipitation to fall as rain instead of snow (Regonda et al. 2005).

For further discussion on climate change, refer to the Climate Change section within the Environmental Baseline section.

ENVIRONMENTAL BASELINE

Under section 7(a)(2) of the Act, when considering the effects of the action on federally listed species, we are required to take into consideration the environmental baseline. Regulations implementing the Act (50 CFR 402.02) define the environmental baseline as the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone section 7 consultation, and the impacts of State and private actions that are contemporaneous with the consultation in progress. 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. We have defined the action area for this Project to include an area 48 m (158 ft) upstream from the bridge, plus an additional 244 m (802 ft) below the US 180 Whitewater Creek Bridge.

Climate Change

"Climate" refers to an area's long-term average weather statistics (typically for at least 20- or 30-year periods), including the mean and variation of surface variables such as temperature, precipitation, and wind. "Climate change" refers to a change in the mean and variability of climate properties that persists for an extended period (typically decades or longer), whether due to natural processes or human activity (IPCC 2007a). Although changes in climate occur continuously over geological time, changes are now occurring at an accelerated rate. For example, at continental, regional, and ocean basin scales, recent observed changes in long-term trends include: a substantial increase in precipitation in eastern parts of North American and South America, northern Europe, and northern and central Asia, and an increase in intense tropical cyclone activity in the North Atlantic since about 1970 (IPCC 2007a); and an increase in annual average temperature of more than 1.1 °C (2 °F) across the United States since 1960 (Karl et al. 2009). Examples of observed changes in the physical environment include: an increase in global average sea level, and declines in mountain glaciers and average snow cover in both the northern and southern hemispheres (IPCC 2007a); substantial and accelerating reductions in Arctic sea ice (e.g., Comiso et al. 2008), and a variety of changes in ecosystem processes, the distribution of species, and the timing of seasonal events (e.g., Karl et al. 2009).

The IPCC used Atmosphere-Ocean General Circulation Models and various greenhouse gas emissions scenarios to make projections of climate change globally and for broad regions through the twenty-first century (Meehl et al. 2007; Randall et al. 2007), and reported these projections using a framework for characterizing certainty (Solomon et al. 2007). Examples include: 1) it is virtually certain there will be warmer and more frequent hot days and nights over most of the earth's land areas; 2) it is very likely there will be increased frequency of warm spells and heat waves over most land areas, and the frequency of heavy precipitation events will increase over most areas; and 3) it is likely that increases will occur in the incidence of extreme high sea level (excluding tsunamis), intense tropical cyclone activity, and the area affected by droughts (IPCC 2007b, Table SPM.2). More recent analyses using a different global model and comparing other emissions scenarios resulted in similar projections of global temperature change across the different approaches (Prinn et al. 2011).

All models have some uncertainty associated with projections due to assumptions used, data available, and features of the models; with regard to climate change this includes factors such as assumptions related to emissions scenarios, internal climate variability and differences among models. Despite this, however, under all global models and emissions scenarios, the overall projected trajectory of surface air temperature is one of increased warming compared to current conditions (Meehl et al. 2007; Prinn et al. 2011). Climate models, emissions scenarios, and associated assumptions, data, and analytical techniques will continue to be refined, as will interpretations of projections, as more information becomes available. For instance, some changes in conditions are occurring more rapidly than initially projected, such as melting of Arctic sea ice (Comiso et al. 2008; Polyak et al. 2010), and since 2000 the observed emissions of greenhouse gases, which are a key influence on climate change, have been occurring at the mid- to higher levels of the various emissions scenarios developed in the late 1990's and used by the IPCC for making projections (Raupach et al. 2007, Figure 1; Pielke et al. 2008; Manning et al. 2010, Figure 1). The best scientific and commercial data available indicates that average global surface air temperature is increasing and several climate-related changes are occurring and will continue for many decades even if emissions are stabilized soon (Meehl et al. 2007; Church et al. 2010; Gillett et al. 2011).

Changes in climate can have a variety of direct and indirect impacts on species, and can exacerbate the effects of other threats. Rather than assessing "climate change" as a single threat in and of itself, we examine the potential consequences to species and their habitats that arise from changes in environmental conditions associated with various aspects of climate change. For example, climate-related changes to habitats, predator-prey relationships, disease and disease vectors, or conditions that exceed the physiological tolerances of a species, occurring individually or in combination, may affect the status of a species. Vulnerability to climate change impacts is a function of sensitivity to those changes, exposure to those changes, and adaptive capacity (IPCC 2007a; Glick et al. 2011). As described above, in evaluating the status of a species, the Service uses the best scientific and commercial data available, and this includes consideration of direct and indirect effects of climate change. If a species is listed as threatened or endangered, knowledge regarding its vulnerability to, and impacts from, climate-associated changes in environmental conditions can be used to help evaluate expected effects of the action for this biological opinion, as well as to help devise appropriate strategies for species recovery.

While projections from global climate model simulations are informative and in some cases are the only or the best scientific information available, various downscaling methods are being used to provide higher-resolution projections that are more relevant to the spatial scales used to assess impacts to a given species (see Glick et al. 2011). With regard to the action area, downscaled projections for the loach minnow are discussed below.

Status of the Species within the Action Area

Loach minnow

Loach minnow have been sporadically collected in Whitewater Creek the last record is from 1984 (Ecosphere Environmental Services [Ecosphere] 2011). The nearest permanent fish monitoring station is Glenwood Ranger Station on the San Francisco River about 1.6 km (1 mi) downstream from the Project area. From 1989 to 1995, the average density of loach minnow was 0.140 per m^2 (0.013 per ft^2) (Paroz et al. 2006). From 1996 to 2005 when the density of loach minnow declined at many locations it stayed about the same at this location at 0.129 per m^2 (0.012 per ft^2) (Paroz et al. 2006). From 2006 to 2010 the density of loach minnow has increased slightly to 0.151 per m^2 (0.014 per ft^2) at the Glenwood Ranger Station site (NMDGF 2012).

Factors affecting the Species Environment within the Action Area

The Project is located on Whitewater Creek a tributary of the San Francisco River. The Whitewater Creek watershed (HUC 150400040607) is approximately 14,141 ha (34,943 acres). Land ownership is 13,403 ha (33,120 acres) National Forest lands and 738 ha (1,823 acres) private lands. The following activities currently occur or have occurred in the past within the Whitewater Creek watershed: highway construction and maintenance; recreation facility development and recreational use; grazing; timber harvest; and wildfires, fire suppression, and wildfire use fires. The upper half of the Whitewater Creek watershed is in the Gila Wilderness where no grazing or timbering is allowed. In addition, the Southwest, including the Gila basin has been experiencing a long-term drought that also may be affecting the species. The effects of all these activities contribute to the current riparian and watershed condition, which are discussed below.

Road and Bridges

The US 180 highway is the primary means of access to Glenwood and the Gila National Forest Catwalk Recreation Area. The Catwalk Road (NM 174) has two low-water crossing with erosion problems that need repair. Whitewater Creek has a large bedload that is deposited in the US 180 bridge area and needs continual maintenance. Heavy equipment has been used to clear bedload and maintain low-water crossing in the past.

Development and Recreation

About five percent of the Whitewater Creek watershed is private lands. The unincorporated community of Glenwood (147 population [US Census 2010]) is in the watershed. The New Mexico Department of Game and Fish Glenwood Fish Hatchery is located along Whitewater Creek. Off US 180 road about 8 km (5 mi) up Catwalk Road (NM 174) is the Catwalk Recreation Area, the second most visited tourist site in the Gila National Forest.

Nonnative species

Competition and predation by nonnative fishes, bullfrogs, and crayfish are thought to be one of the primary causes for the decline of native species (Miller 1961). Many nonnative fish have been introduced into the San Francisco River basin including red shiner, channel catfish, flathead catfish, black and yellow bullheads (*Ameiurus melas* and *Ameiurus natalis*), and western mosquitofish (*Gambusia affinis*) (Propst et al. 1986; Bestgen and Propst 1989). Due to declining native trout populations, the State of New Mexico propagated and stocked rainbow trout (*Oncorhynchus mykiss*), cutthroat trout (*Oncorhynchus clarkii*), and brown trout (*Salmo trutta*) during the early 1900s on the Gila National Forest to improve angler success. After early stocking programs were discontinued the nonnative trout species persisted and overlap in distribution with loach minnow. Brown trout in particular, are piscivorous and may prey on native cyprininds. At the Glenwood Ranger Station site, less than 1 percent of the fish collect were nonnative (Paroz et al. 2006). This suggests that nonnative fishes are unlikely the cause of the decline in native fishes at this site.

Livestock grazing

In the late 1800s and early 1900s, livestock grazing was uncontrolled and unmanaged over many of the watersheds that contain loach minnow and much of the landscape was denuded of vegetation (Rixon 1905; Duce 1918; Leopold 1921; Leopold 1924; Ohmart 1996). Heavy livestock grazing has been shown to increase soil compaction, decrease infiltration rates, increase runoff, change vegetative species composition, decrease riparian vegetation, increase stream sedimentation, increase stream water temperature, decrease fish populations and change channel form (Meehan and Platts 1978; Kauffman and Kruger 1984, Schulz and Leininger 1990; Platts 1991; Fleischner 1994; Ohmart 1996). One or several of these factors in combination may have affected loach minnow populations historically. Livestock grazing on the Glenn Allotment, upstream of the action area, ceased in 1957. There are two Forest Service grazing allotments, Holt Gulch and Mogollon, covering about 20 percent of the Whitewater Creek watershed upstream of the action area. Only Holt Gulch is currently active.

Although livestock grazing within watersheds where loach minnow and its designated critical habitat are located is less than in the past it continues to cause adverse effects. These adverse effects occur through watershed alteration and subsequent changes in the natural hydrograph, sediment production, and stream channel morphology (Platts 1991; Belsky et al. 1999; Service 2001).

Timber harvest

Logging activities in the early to mid 1900s likely caused major changes in watershed characteristics and stream morphology (Chamberlin et al. 1991). Rixon (1905) reported the upper Whitewater Creek watershed to be the most heavily timbered in the area. Early logging efforts were concentrated along canyon bottoms, often with perennial streams. Tree removal along perennial streams within the historical range of the loach minnow likely altered water temperature regimes, sediment loading, bank stability, and availability of large woody debris (Chamberlin et al. 1991).

Fire

Severe wildfires capable of extirpating or decimating fish populations are a relatively recent phenomenon, and result from the cumulative effects of historical or ongoing grazing (removal of fine fuels needed to carry fire) and fire suppression (Madany and West 1983, Savage and Swetnam 1990; Swetnam 1990; Touchan et al. 1995; Swetnam and Baisan 1996; Belsky and Blumenthal 1997; Gresswell 1999). Historical wildfires were primarily cool-burning understory fires with return intervals of 3-7 years in ponderosa pine (*Pinus ponderosa*) (Swetnam and Dieterich 1985). Cooper (1960) concluded that prior to the 1950s; crown fires were extremely rare or nonexistent in the region. High-severity wildfires, subsequent floods and ash flows, have caused the extirpation of several populations of Gila trout (*Oncorhynchus gilae*) since 1989 (Propst et al. 1992; Brown et al. 2001) but effects on loach minnow are not known.

The Whitewater Creek watershed has had only two large (greater than 200 ha [500 acres]) fires in the last 20 years. Effects of fire may be direct and immediate or indirect and sustained over time (Gresswell 1999). Because loach minnow are found primarily in the lower elevation, higher-order streams, they are most likely affected by the indirect effects of fire (e.g., ash flows), not direct effects (e.g., drastic changes in pH, ammonium concentrations). Indirect effects of fire include ash and debris flows, increases in water temperature, increased nutrient inputs, and sedimentation (Bozek and Young 1994; Gresswell 1999). Of these, ash flows probably have the greatest effect on loach minnow. Ash and debris flows may occur months after fires when barren soils are eroded during the rainy season (Bozek and Young 1994; Brown et al. 2001). Ash and fine particulate matter created by fire can fill the interstitial spaces between gravel particles eliminating spawning habitat or, depending on the timing, suffocating eggs that are attached to the gravel. Ash and debris flows can also decimate aquatic invertebrate populations that the fish depend on for food (Molles 1985; Rinne 1996; Lytle 2000). There are no reported ash flows in the Whitewater Creek watershed.

Stream and riparian condition

The lower Whitewater Creek watershed has a turbidity impairment and the upper watershed has an aluminum impairment (New Mexico Environment Department 2009). The Forest Service has assessed the watershed as a Class 2 – Functional at Risk watershed because of nonnative species and water quality impairment (Koury 2012). Riparian vegetation in the action area is dominated by coyote willow (*Salix exigua*), bluestem willow (*Salix irrorata*), Arizona alder (*Alnus oblongifolia*), and cottonwood (Ecosphere 2011). No exotic plants have not been found in the action area.

Climate change

General climate changes effects on the region are found under the Climate Change section of the Status of the species. Climate change predicts four major effects on the loach minnow habitat:

1. increased water temperature;
2. decreased streamflow;
3. a change in the hydrograph; and
4. an increased occurrence of extreme events (fire, drought, and floods).

Increased water temperature. Kundzewicz et al. (2007) state that of all ecosystems, freshwater ecosystems will have the highest proportion of species threatened with extinction due to climate change. Species with narrow temperature tolerances will likely experience the greatest effects from climate change and it is anticipated that populations located at the margins of species hydrologic and geographic distributions will be affected first (Meisner 1990). Small changes in water temperature are well known to have considerable effects on freshwater fishes by affecting a variety of life history, behavioral, and physiological aspects (Morgan et al. 2001; Carveth et al. 2006). Alterations in the temperature regime from natural background conditions negatively affect population viability, when considered at the scale of the watershed or individual stream (McCullough 1999). Small streams in the Gila River basin experience high summer temperature. Spikedace and loach minnow have thermal tolerances in the lower range for native fishes (Carveth et al. 2006; Widmer et al. 2006). As such, these species may be adversely affected by increased water temperature.

Decreased stream flow. Current models suggest a decrease in precipitation in the Southwest (Kundzewicz et al. 2007; Seager et al. 2007) which would lead to reduced stream flows and a reduced amount of habitat for loach minnow. Stream flow is predicted to decrease in the Southwest even if precipitation were to increase moderately (Nash and Gleick 1993; New Mexico Office of the State Engineer 2005; Hoerling and Eischeid 2007). Winter and spring warming causes an increased fraction of precipitation to fall as rain, resulting in a reduced snow pack, an earlier snowmelt, and decreased summer base flow (Christensen et al. 2004; Stewart et al. 2004; Regonda et al. 2005). Earlier snowmelt and warmer air temperatures can lead to a longer dry season. Warmer air temperatures lead to increased evaporation, increased evapotranspiration, and decreased soil moisture. These three factors could lead to decreased stream flow even if precipitation increased moderately.

The effect of decreased stream flow is that streams become smaller, intermittent or dry, and thereby reduce the amount of habitat available for aquatic species. A smaller stream is affected more by air temperature than a larger one, exacerbating the effects of warm and cold air temperatures (Smith and Lavis 1975). In addition, fish isolated in pools may be subject to increased predation from terrestrial predators.

Change in the hydrograph. Another documented effect of climate change is a shift of the timing of spring snowmelt. Stewart et al. (2004) show that timing of spring streamflow in the southwestern United States during the last 5 decades has shifted so that the major peak now arrives 1 to 3 weeks earlier, resulting in less flow in the spring and summer. They conclude that almost everywhere in North America, a 10 to 50 percent decrease in spring-summer streamflow fractions will accentuate the seasonal summer dry period with important consequences for warm-season water supplies, ecosystems, and wildfire risks (Stewart et al. 2004). Stewart et al. (2004) suggest that with climate model projected air temperature increases, snowmelt driven runoff in the western United States could occur as much as 30-40 days earlier than present. Changes in the hydrograph could potentially alter the native fish assemblages. Variability in the hydrographs and greater flow volume has been shown to sustain native fishes (i.e., loach minnow) over nonnatives between periodic flood events (Rinne and Miller 2006).

Increased occurrence in extreme events. Extreme events such as drought, fires, and floods are predicted to occur more frequently because of climate change (IPCC 2007b). It is anticipated that an increase in extreme events will most likely affect populations living at the edge of their physiological tolerances. The predicted increases in extreme temperature and precipitation events may lead to dramatic changes in the distribution of species or to their extirpation or extinction (Parmesan and Matthews 2006).

Drought

The Southwest U.S. is currently experiencing drought conditions (University of Nebraska-Lincoln 2010). Portions of New Mexico are also considered abnormally dry, but not in areas currently occupied by spikedace and loach minnow (University of Nebraska-Lincoln 2010). While spikedace and loach minnow have survived many droughts in their evolutionary histories, the present status of these species and their habitat are so degraded that the effects of the drought may be more difficult for the species to withstand. In some areas of spikedace and loach minnow habitat, drought results in lower streamflow and consequent warmer water temperatures, and more crowded habitats with potentially higher levels of predation and competition. In other areas drought reduces flooding, which would normally rejuvenate habitat and tend to reduce populations of some nonnative species, which are less adapted to the large floods of Southwest streams (Minckley and Meffe 1987; Stefferud and Rinne 1996).

Although loach minnow evolved in the Southwest and have survived drought in the past, it is anticipated that a prolonged, intense drought would affect many populations, in particular those occupying the upper range of their distribution, which are more likely to dry or become intermittent. Downstream reaches are larger streams that historically could have provided refugia for populations threatened by stream drying. Many of these reaches are now occupied by nonnative fishes. In addition to stream drying, there is a clear association between severe droughts and large fires in the Southwest (Swetnam and Baisan 1994).

Fire

Since the mid-1980s, wildfire frequency in western forests has nearly quadrupled compared to the average of the period 1970 to 1986. The total area burned is more than six and a half times the previous level (Westerling et al. 2006). In addition, the average length of the fire season during 1987 to 2003 was 78 days longer compared to 1970 to 1986 and the average time between fire discovery and control increased from about 8 to 37 days for the same time frames (Westerling et al. 2006). McKenzie et al. (2004) suggest, based on models, that the length of the fire season will likely increase and fires in the western United States will be more frequent and severe. In particular, they found that fire in New Mexico appears to be acutely sensitive to summer climate and temperature changes and may respond dramatically to climate warming (McKenzie et al. 2004).

Floods

Floods that occur after intense wildfires that have denuded the watershed are also a threat. An increase in rain or snow events, intense precipitation that is unseasonable or heavy precipitation that occurs after fire, could impact loach minnow. High-severity wild fires, subsequent floods, and ash flows have caused the extirpation of some fish populations (Propst et al. 1992; Brown et al. 2001), but it is not known if spikedace or loach minnow have suffered local extirpations.

The conjunction of climate change with ongoing habitat loss and alteration and nonnative species competition has caused a general loss of resiliency in the ecosystem and has serious consequences for the loach minnow.

EFFECTS OF THE ACTION

Direct Effects

Potential adverse effects of the action include streambed disturbance by heavy equipment (rubber-tired loader, backhoe and Bobcat) (a total area of 0.24 hectares (ha) or 0.58 acres); a temporary increase in turbidity; and increased sedimentation downstream. The action will take place outside the spawning season for loach minnow and during low flow, so eggs are unlikely to be affected by construction. Implementation of proposed conservation measures and compliance with section 401 and 404 permits will reduce potential adverse impacts. Loach minnow are benthic dwellers, and may not be readily detected when low in abundance. This species is probably very rare or in low numbers in the action area. In the unlikely event that loach minnow are present in the action area, they could be killed or injured due to construction activities in the river channel, as well as during preconstruction fish sampling. It is possible that the heavy equipment could crush loach minnow, although the likelihood of this occurring is very low. This equipment would be in the river channel about 102 hours, and we expect that healthy fish would detect the approach of a large, slow-moving object, such as a backhoe or front-end loader, and flee the area. However, the possibility that a fish could be caught and crushed under the treads cannot be ruled out. Because recent surveys in the action area did not find loach minnow the probability that any fish would be directly impacted by the heavy equipment is reduced. Prior to construction the action area will be surveyed, and fish and other aquatic vertebrates will be salvaged. The absence of loach minnow in the Project area based on these efforts will be an indicator of low risk of impacts to the species. In addition, block nets used during survey will remain in place during Project implementation to prevent fish from reentering the Project area.

Indirect Effects

The heavy equipment will likely crush and kill many invertebrates, a primary food source for the loach minnow. Some invertebrates will be dislodged from the substrate and drift downstream. However, the area directly disturbed by the heavy equipment is small, relative to the upstream area that would serve as a source of invertebrate colonizers. Flow will remain in the channel, leaving a limited amount of habitat for those invertebrates capable of surviving in the area. However, many invertebrates may die, if they were incapable of finding water, or if exposed to predation as they drifted downstream. The action area will have a limited food source for fish until the habitat is recolonized by invertebrates. Colonization should occur primarily from drift from upstream (Williams and Hynes 1976). Some colonists will occupy the habitat almost immediately but the density of invertebrates will be very low. Because loach minnow depend on aquatic invertebrates as a major food source, the disturbed channel will have a short-term impact approximately 6-12 months on the food supply until the channel is fully recolonized. The project actions will temporarily increase food supply to downstream invertebrate-eating species, including loach minnow. Suitable physical habitat will be created for loach minnow in the disturbed channel but sufficient food may not be available to the species for several months. Consequently there is a net loss of suitable habitat in the short term because of the Project. Turbidity in the action area and downstream will increase when the heavy equipment are working on the Project. There are two consequences from this activity, one positive and one negative. The potential negative impact is caused by the increase turbidity and deposition of fines (silt and sand) downstream of the action area. This effect will be of moderate intensity and short duration. Loach minnow were documented downstream of the action area at the Glenwood Ranger Station on the San Francisco River (Paroz et al. 2006). A straw bale barrier will be placed downstream from the Project area to reduce turbidity. This simple measure reduced sediment yield by 98 percent in streams with similar characteristics to Whitewater Creek (Foltz et al. 2008). The downstream turbidity is not expected to cause mortality to either fish or invertebrates.

Designated Critical Habitat

Effects of the designated critical habitat PBFs is the same as described in the previous paragraphs. The total linear length of designated critical habitat impacted will be approximately 186 m (610 ft) and a total area disturbed of 0.24 ha (0.58 acres). In addition, there will be temporarily modification of approximately 0.03 ha (0.06 acres) of designated critical habitat. This area will most likely maintain the PBFs in the future. Temporary effects to PBFs that may occur in the downstream of the action area include changes to the flow, amount of fine sediment and substrate embeddedness, contaminants, and the aquatic food base. These downstream changes are expected to be temporary during project implementation, and are expected to return predisturbance conditions. These effects will not measurably reduce the ability of the designated critical habitat to contribute to the recovery of the loach minnow on either Whitewater Creek or rangewide. PBF 1 pertains to the presence of permanent, flowing, water with no or minimal pollutant levels. The Project will alter flow patterns for a short term and measures are proposed to minimize any potential pollutants. PBF 2 pertains to maintenance of appropriate substrates and particle size distributions, and maintenance of a hydrograph that allows for adequate river functions. The action will change the substrate condition but should return to normal conditions through spring runoff. The action will not alter the flood or base flow hydrographs of Whitewater Creek. PBF 3 pertains to streams gradient; water temperature; pool, riffle, run, and backwater components; and an abundant aquatic insect food base. Because of the small scale of the impacts there should be no change to stream gradient or habitat components. The aquatic food base will be temporarily disturbed, but is expected to return to normal levels. PBF 4 includes maintaining habitat devoid of nonnative fish species detrimental to loach minnow or habitat in which detrimental nonnative fish species are at levels which allow persistence of loach minnow. The action will have no effect on nonnative fish abundance or distribution. PBF 5 addresses the need to maintain connective corridors between occupied or seasonally occupied habitat and through which the species may move when the habitat is wetted. The action includes a short-term impact to flow, but this effect will be temporary. The action's limited effects to the PBFs will not diminish or preclude the role of the action area in both the survival and recovery of the species.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local, or private actions on endangered or threatened species or designated critical habitat that are reasonably certain to occur in the foreseeable future in the action area considered in this biological opinion. Future Federal actions that are unrelated to the action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. Cumulative effects analysis as stated here applies to section 7 of the Act and should not be confused with the broader use of this term in the National Environmental Policy Act or other environmental laws. Two actions may cumulatively affect loach minnow in this location. First, the bridge channel will need ongoing maintenance and bank stabilization, because the bridge span is too narrow to allow the river to move naturally and accumulate sediments at this location.

Much of the lower Whitewater Creek watershed is private lands. On these lands poor land management practices may result in accelerated erosion that may cause more frequent maintenance at the US 180 bridge site and alter habitat for the loach minnow. The Service is working with willing landowners to improve riparian habitat and minimize erosion. These effects have not been quantified.

CONCLUSION

After reviewing the current status of the loach minnow, the environmental baseline for the action area, the effects of the action, and the cumulative effects, it is the Service's biological opinion that the action will neither jeopardize the continued existence of the loach minnow nor destroy or adversely modify its designated critical habitat. We reached this conclusion because the action is very limited in scope, conservation measures will be in place, and if the species are present in the action area they will be translocated upstream prior to construction. Habitat quality may become impaired in the short term because of the fine sediments released from the Project area and carried downstream.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, or collecting, or attempting to engage in any such conduct. Harass is further defined by us as intentional or negligent actions that creates 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, and sheltering. Harm is further defined by us to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. 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 a prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this incidental take statement.

Amount and Extent of Take Anticipated

The Service has developed the following incidental take statement based on the premise that channel maintenance at the US 180 bridge on Whitewater Creek will be implemented as proposed. Take of loach minnow is expected in the forms of harm and harassment due the proposed channel excavation activities, and is restricted to the action as proposed. Based on the best available information concerning loach minnow, the habitat needs of these species, the project description, and information furnished by NMDOT, take is considered likely for loach minnow during the proposed action. Nevertheless, because of the low density of this species in the action area, the lack of recent data on the species presence, the difficulty of detecting harassment of a small fish, and the expectation that no other form of take will occur (e.g., no mortalities or injuries that might be more detectable), it is not possible to estimate the number of individuals that will be taken with implementation of this project. Therefore, the amount of habitat disturbed will be used as a surrogate measure of incidental take. Based upon the proposed project, it is estimated that harm of loach minnow will occur in occupied habitat over a footprint of approximately 0.24 ha (0.58 acres) of disturbed habitat, and temporary modification of 0.03 ha (0.06 acres) of designated critical habitat. If actual incidental take meets or exceeds the predicted level (0.24 ha) (0.58 acres), the Corps must reinitiate consultation. The Service notes that this represents a best estimate of the extent of take that is likely during the proposed action. Thus, estimated incidental take may be modified from the above should population monitoring information or other research indicate substantial deviations from the estimated extent of incidental take, or if it allows for a calculation of the amount of take that will occur. In this case further consultation may be necessary.

Effect of the take

In this biological opinion, the Service determines that the level of take did not result in jeopardy to the loach minnow, nor destruction or adverse modification of designated critical habitat. The Service reached this conclusion because: the amount of area disturbed is very limited; the amount of time that the area will be disturbed is very limited (direct impacts up to 17 days or less within the River); the likelihood that loach minnow occupied the action area at the time of the action is low because abundance is low in the area, and any fish present will be translocated prior to implementation of the action, contamination of the river by petroleum products will be minimized as described in their conservation measures; conditions of the 401 and 404 permits will be followed; and primary constituent elements of designated critical habitat will be insignificantly affected.

Reasonable and Prudent Measures

No reasonable and prudent measures or terms and conditions are identified, as the conservation measures include all reasonable and prudent measures necessary to minimize incidental take.

The Applicant will report annually by March 31 of the following year any activities associated with the project and the amount of habitat disturbed.

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 an action on listed species or designated critical habitat, to help implement recovery plans, or to develop information. The recommendations provided here relate only to the action and do not necessarily represent complete fulfillment of the agency's section 7(a)(1) responsibility for these species. In order for us to be kept informed of actions that either minimize or avoid adverse effects or that benefit listed species and their habitats; we request notification of the implementation of the conservation recommendations. We recommend the following conservation recommendations be implemented. Because of the location and dimensions of the US 180 bridge channel maintenance issues will be ongoing. A long-term solution that addresses the continual maintenance on the US 180 bridge channel should be pursued. NMDOT should investigate the replacement of the bridge with a wider span that does not constrict the channel at this location. In the short term we recommend that NMDOT pursue improvement in upstream sediment capture in an ephemeral area that could be maintained without working in flowing water.

Reporting Requirements/Disposition of Dead or Injured Listed Animals

Upon finding a dead or injured threatened or endangered animal, initial notification must be made to the Service's Division of Law Enforcement, 4901 Paseo Del Norte NE, Suite D, Albuquerque, New Mexico, 87113 (505-346-7828) within 3 working days of its finding. Written notification must be made within 5 calendar days and include the date, time, and location of the animal, a photograph, and any other pertinent information. Care must be taken in handling injured animals to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible condition. If feasible, the remains of intact specimens of listed animal species shall be submitted as soon as possible to the nearest Service or NMDGF office, educational, or research institutions (e.g., University of New Mexico) holding appropriate state and Federal permits.

CLOSING STATEMENT

This concludes formal consultation on the US 180 bridge channel maintenance permit. As provided in 50 CFR 402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may adversely affect listed species or designated 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 a listed species or designated critical habitat that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by this action. We appreciate the U.S. Army Corps of Engineers' and New Mexico Department of Transportation efforts to identify and minimize effects to listed species from this Project. In future communications regarding this Project please refer to consultation number 02ENNM00-2012-F-0030. If you have any questions or would like to discuss any part of this biological opinion, please contact George Dennis of my staff at (505) 761-4754 or george_dennis@fws.gov.

Sincerely,

Wally Murphy
Field Supervisor

cc:

Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico (electronic copy)
Director, New Mexico Energy, Minerals, and Natural Resources Department, Forestry Division, Santa Fe, New Mexico (electronic copy)
Field Supervisor, U.S. Fish and Wildlife Service, Arizona Ecological Services Field Office, Phoenix, Arizona (electronic copy)
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Regional Section 7 Coordinator (ES), Region 2, U.S. Fish and Wildlife Service, Albuquerque, New Mexico (electronic copy)
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