

INTRA-SERVICE SECTION 7 BIOLOGICAL EVALUATION and OPINION

Originating Person: Vanessa Martinez

**Project Name: NM T-55-R-1 Chihuahua Chub Habitat Improvements in the
Mimbres River (F16AF00428)**

Telephone Number: 505/248-7452

Start Date: February 2, 2016

End Date: February 2, 2017

Consultation Number: 02ENNM00-2016-F-0474

**I. Region: Southwest, Region 2, New Mexico Ecological Services Field
Office (NMESFO)**

II. Service Activity (Program): State Wildlife Grants

III. Pertinent Species and Habitat: (E=Endangered, T=Threatened)

A. Listed species and/or their critical habitat within the action area:

Chiricahua leopard frog (*Lithobates chiricahuensis*) (frog) (T/CH)

Chihuahua chub (*Gila nigrescens*) (chub) (T)

Southwestern willow flycatcher (*Empidonax traillii extimus*) (flycatcher) (E/CH)

Western Distinct Population Segment of the Yellow-billed Cuckoo
(cuckoo) (*Coccyzus americanus*) (T)

B. Proposed species and/or proposed critical habitat within the action area:

None

C. Candidate species within the action area:

None

II. Geographic area/Action Area:

The proposed project would be located on New Mexico Game Commission-owned land along the Mimbres River in Grant County, New Mexico. The project is approximately 4.5 miles (7.2 kilometers) upstream of the New Mexico Highway 152 Bridge.

III. Location:

A. Ecoregion: Upper Middle Rio Grande

B. County and State: Grant County, New Mexico

C. Section, Township, and Range (or Latitude and Longitude):

The legal coordinates of the proposed project area are: Sections 1 and 11, Township 17 South, Range 11 West, New Mexico Principal Meridian..

D. Distance (Miles) and Direction to Nearest Town:

The project is located in Grant County, New Mexico, approximately 2 miles (3.2 kilometers) south of the Town of Mimbres, New Mexico. New Mexico State Route 35 parallels the project area. The project area and vicinity is shown on Figure 1 in Appendix B.

IV. Description of Proposed Action and Proposed

Proposed Action:

The Service's Wildlife and Sport Fish Restoration Program is proposing to fund the New Mexico Department of Game and Fish (NMDGF) to undertake the Mimbres River Habitat Improvement Project to contribute to the recovery of the Chihuahua chub (*Gila nigrescens*) and the Chiricahua leopard frog (*Lithobates chiricahuensis*) by enhancing habitat within a New Mexico Game Commission-owned parcel on the Mimbres River. The habitat improvements would enhance approximately 4,500 feet (1,372 meters) of the Mimbres River in Grant County, New Mexico. Details of the proposed action can be found in the Mimbres River Habitat Improvements Final Biological Assessment (2016), included as an Appendix to this document, which is hereby incorporated by reference.

Conservation Measures

Southwestern Willow Flycatcher and Yellow-billed Cuckoo

- 1) Work during bird breeding season for these species (May 15 – July 17) will be avoided.
- 2) Should the need arise to work during the breeding season a qualified Service biologist will survey the site for nesting birds. Any nests located will be flagged and avoided by heavy equipment.

Chiricahua Leopard Frog

The proposed project is scheduled to occur during breeding season for Chiricahua leopard frog. Prior to construction, in April, the NMDGF, with assistance from the USFWS, will survey for and collect egg masses, larvae, and adult frogs. Any eggs, larvae, or frogs removed will be relocated to completed construction areas, a Nature Conservancy property downstream of the proposed project, or Moreno Springs. Additional Chiricahua leopard frog conservation measures include:

- Surveys for this species will consist of two diurnal surveys and one nocturnal survey, followed by shocking/electrofishing.
- The NMDGF will survey and translocate egg masses prior to hatching.
- After construction has been completed, in coordination with the USFWS, NMDGF will conduct repatriation of individuals back into the action area as necessary.
- A wildlife escape structure will be installed within the upgraded cattle guard at the river crossing.
- Use of block nets to prevent metamorphs from moving into the project area should construction extend a few days past July 15.
- No walnut (*Juglans* sp.) species will be used due to toxicity.
- If construction activities cannot be completed by July 15, the proposed project will be postponed until the fall to avoid metamorphosing season for the Chiricahua leopard frog.

To reduce the potential for introduction of disease to existing frog populations, such as Ranavirus or chytridiomycosis, from construction materials, the following conservation measures will be implemented:

- All equipment will be cleared of mud, soil, and/or organic debris and steam

- cleaned prior to entering the Mimbres watershed.
- All woody debris used in construction will be sourced from upland sources and will consist of species (e.g., oak/pine/juniper) that are native to the Mimbres watershed.
 - Any riparian or wetland trees used will come from within the Mimbres watershed.
 - All rock/boulders/gravel brought from outside the Mimbres River basin will be sourced from upland quarries.
 - Plants used in wetland re-planting will include cottonwoods and willows harvested from on site.
 - Wetlands areas will also be seeded. No plugs or live plants from offsite will be used.
 - All field equipment including waders, aquatic gear and other field equipment (boots, nets, holding containers, truck tires, etc.) will be disinfected to reduce the risk of introducing aquatic diseases.

Chihuahua chub

The proposed project is scheduled to occur during the spawning season for the Chihuahua chub. The NMDGF, with assistance from the USFWS, will perform surveys to translocate Chihuahua chub out of the project area prior to construction. If 50 or more Chihuahua chub are removed during electrofishing surveys, the NMDGF will install block nets upstream and downstream of the project area to prevent individuals from moving into the project area during construction.

The NMDGF will monitor Chiricahua leopard frog and Chihuahua chub populations within the project area annually. The NMDGF will also conduct photo-point monitoring to record vegetation and habitat regeneration or changes.

V. Status of the Species, Status of the Species in the Action Area, Environmental Baseline:

Chiricahua Leopard Frog

A summary of the species and recent status of the frog can be found in the final 5-year review for the Chiricahua leopard frog (Service 2011) and in the final rule published on March 20, 2012 (77FR16324) where critical habitat was designated concurrently with a reassessment of the status and threats to the species.

Additional information can be found in Chiricahua Leopard Frog Final Recovery Plan (Service 2007). These documents are hereby incorporated by reference.

The frog is known currently and historically to occupy cienegas (mid-elevation wetland communities often surrounded by arid environments), pools, livestock tanks, lakes, reservoirs, streams, and rivers at elevations of 994 – 2694 m (3281 - 8890 ft.) in central and southeastern Arizona; west-central and southwestern New Mexico; and northern Sonora and the Sierra Madre Occidental of Chihuahua and Durango, Mexico. Extensive research was conducted to determine the extent of populations remaining, resulting in the listing of the species as threatened in 2002.

Shallow waters with emergent and perimeter vegetation provide tadpole and adult basking habitats, while deeper water, root masses, and undercut banks provide refuge from predators and potential sites for hibernation (Sredl and Jennings, 2005). Most perennial waters supporting frogs possess fractured rock substrate, emergent or submergent vegetation, deep water, root masses, undercut banks, or some combination of these features that frogs may use as refugia from predators and climatic conditions. Frogs may over-winter at or near breeding sites, although these microsites have not been studied. Other leopard frogs typically over-winter at the bottom of well-oxygenated ponds and may bury themselves in the mud (Nussbaum et al. 1983, Harding 1997).

The Chiricahua Leopard Frog Final Recovery Plan defines a robust population as one containing at least 60 adults and exhibiting a diverse age class distribution that is relatively stable over time. A population of 40-50 adults can also be “robust” if it resides in drought-resistant habitat. The Mimbres River overall can be considered moderately drought-resistant due to spring influence in the immediate area; however, dewatering of the river for irrigation also occurs seasonally. The number of adult frogs along the Mimbres River, particularly including the newly renovated Moreno Springs area, located upstream of this project would be considered robust. However, in the action area, the number of frogs is limited due to limited habitat suitable for breeding, basking, cover, and overwintering, and thus the number of adult frogs has been documented at 10 or fewer, and would not be characterized as a robust at this time.

In June 2013, the Silver Fire severely burned portions of the Mimbres watershed and was followed by heavy rains in September that resulted in high ash and sediment laden flows in the Mimbres River. These high debris flows deposited up to 4 ft of sediment in some areas, and filled in off-channel breeding pools for frogs on a nearby property along the Mimbres River (M. Christman, pers. obs. Jan 2014). Prior to the flooding, there existed large logs and large woody debris piles

throughout this portion of the Mimbres River that the frogs were commonly observed using. Subsequent to the flows, some of the large woody debris and other structures were washed away or filled in, reducing the suitability of Chiricahua leopard frog habitat. The long-term impact from the fire and subsequent flooding and sedimentation to this population of frogs remains unknown.

In 2014, the Moreno Springs area located upstream of the action area of this project underwent a habitat renovation project that included constructing new off-channel pool habitat. Preliminary data indicate a high response in Chiricahua leopard frog numbers throughout the renovated area.

Threats to this population of frogs includes the presence of disease, non-native species (e.g. crayfish), and the decrease or loss of habitat from the filling in of pools with sediment or ash, and extreme post-fire flooding. While the amphibian chytrid fungus *Batrachochytridium dendrobatidis* (*Bd*) is present in this population, there may be biotic and abiotic factors that allow these frogs to persist with the disease.

Chiricahua Leopard Frog Critical Habitat

On March 20, 2012 (77FR16324), the Service designated critical habitat for the frog and identified 39 critical habitat units within the species' geographical range. There is no designated critical habitat for the frog within the action area..

Chihuahua Chub

In 1976 the Chihuahua chub, a member of the minnow family (Cyprinidae), was listed as endangered by the State of New Mexico and it is considered threatened by the Republic of Mexico (Propst 1999). In 1983, the Service listed the chub as a threatened species under the Act, as amended, without critical habitat (Service 1983).

The Chihuahua chub is endemic to the Guzman Basin in southwestern New Mexico, where it occupies the Mimbres River and extends into several other drainages in the Guzman and Laguna Bustillos Basins in the northwestern portion of Chihuahua in Mexico (Propst and Stefferud 1994). In New Mexico, a systematic sampling effort conducted in the Mimbres drainage over 4 years that concluded in 1991, indicated that Chihuahua chub were found intermittently along a 7.5-mile (12.1 kilometer) reach of the Mimbres River downstream from its confluence with Allie Canyon and in Archuleta/Moreno Spring, which supported the greatest number of individuals. Propagated Chihuahua chub have been stocked back into the

Mimbres River and McKnight Creek, a tributary to the Mimbres River, to augment and expand the wild population. McKnight Creek was stocked in 1992 and 1998 with approximately 450 and 515 adult fish, respectively. Recent surveys in McKnight Creek have not found Chihuahua chub. In 2008 and 2009, Chihuahua chub were discovered in the Mimbres River near Cooney, New Mexico, approximately 10 miles (16.5 kilometers) upstream from Allie Canyon (USFWS 2010a). The Mimbres River was stocked in 1998, 2000 to 2005, and in 2008 (Knight 2009). Typically, fish 76-100 mm (3-4 in) are stocked on the NMDGF and TNC properties.

In 2011, because of potential channel drying, 10 chub were evacuated from the Mimbres River near Cooney Place during May and were held at Southwestern Native Aquatic Resources and Recovery Center (formerly Dexter National Fish Hatchery and Technology Center) (Service 2012). In addition, flows associated with the Silver Fire and related impacts in 2013 greatly reduced and possibly eliminated chub from the Mimbres River (Service 2014). A post-fire survey effort in the Mimbres River was found to be fishless; and although the survey effort at Moreno Spring found other fish species present, Chihuahua chub were absent (Service 2014).

Consequently, the chub held at the Southwestern Native Aquatic Resources and Recovery Center, were used to repopulate the Mimbres River, approximately 5000 individuals were stocked (Service 2014). Post-stocking surveys confirmed the presence of chub in the Mimbres River and Moreno Spring, however, it is unclear if the fish in Moreno Spring are stocked or individuals that may have found refuge in the Spring (Service 2014).

Chub habitat is comprised of deep pools associated with undercut banks (Sublette et al. 1990) or overhanging vegetation which provides cover and foraging habitat (Service 1986). Adult chub are considered habitat specialists and are found primarily in lateral scour pools, beneath undercut banks, or under other solid objects (e.g., logs, boulders) adjacent to moderate to fast flowing water in small to medium sized streams (Miller and Chernoff 1980, Propst and Stefferud 1994). Corner and backwater pools containing large woody debris are also used. Almost all habitats occupied by chub have extensive cover composed of organic debris or root wads of large trees. Occupied pools are typically 1-2 m (3.3-6.6 ft) deep, water velocity less than 15 cm/sec (0.5 ft/sec), and the substrate small-grained (sand to pea-size) (Propst and Stefferud 1994, Propst 1999). The pools are located adjacent to runs with flows greater than 60 cm/sec (2 ft/sec) and downstream from cobble-bottomed riffles (Propst 1999). Juveniles are found in shallower water with

or without cover (Miller and Chernoff 1980).

Habitat loss and modification is the primary threat to the chub in the Mimbres Rivers. Historically, the Mimbres River was described as a relatively deep (0.8 m [2.5 ft]), slow moving river with a series of pools or lagoons at its terminus, bordered with thickets of native willows (*Salix* spp.) (Antisell 1856). Today river conditions have been drastically altered through numerous diversions and stream modifications, reducing both the quantity of water in the river and the quality of its adjacent riparian habitat. Additionally, ash flows from recent wildfires in the Mimbres River drainage, including the Silver Fire in 2013, have reduced riverine chub populations by modifying water chemistry and increasing sedimentation (Propst 1999). The presence of the parasitic yellow grub (*Clinostomum complanatum*) in Moreno Spring is a threat due to the possibility of reduced survival caused by excessively infected fish (Propst 1999).

VI. Determination of Effects and Effects of the Action

Southwestern Willow Flycatcher

Direct impacts to southwestern willow flycatcher could include short-term avoidance by migrating individuals that may incidentally occur in the action area during construction. Construction is scheduled to occur in May and June, which would coincide with the end of the migratory season (May) and beginning of the breeding season (June) for this species. Avoidance of the project area would be limited to the duration of construction. There would be no loss or modification of suitable breeding habitat for southwestern willow flycatcher. Direct impacts to suitable migratory habitat would be the short-term loss of approximately 1.9 acres (0.8 hectare) in the proposed access routes, staging areas, and pond creation, and approximately 1.3 acres (0.6 hectare) of riparian vegetation along the riverbank from channel realignment. Shrub and tree removal in the staging area would be limited to the extent practicable. All disturbed areas would be reclaimed following construction. Indirect impacts would be beneficial to this species from habitat improvements that would provide additional habitat diversity. Once established, willows, cottonwoods, and native riparian shrubs planted would provide improved habitat for this species that over time may develop into suitable nesting habitat. Fencing to restrict livestock from the project area would allow existing and reclaimed vegetation to regenerate more quickly.

The proposed action may affect, but is not likely to adversely affect the southwestern willow flycatcher. The proposed action would have no effect on designated critical habitat for this species.

Yellow-billed Cuckoo

Direct impacts to this species include short-term avoidance of the project area by individuals that might incidentally migrate through the action area during construction. Construction is scheduled to occur in May and June, which would coincide with the migratory season for this species (June). Avoidance of the project area would be limited to the duration of construction. Direct impacts also include the temporary loss of approximately 1.9 acres (0.8 hectares) of migratory stopover habitat in the proposed staging area and access routes. There would be no loss of breeding habitat for this species. Shrub and tree removal in the staging area would be limited to the extent practicable. All disturbed areas would be reclaimed following construction. Indirect impacts would be beneficial to yellow-billed cuckoo from habitat improvements that would provide additional habitat diversity. Riparian vegetation in the cleared areas would likely regenerate in 5 years; however, large cottonwoods would likely not re-establish within that timeframe. Once established, willows, cottonwoods, and native riparian shrubs would provide improved habitat for this species. Fencing to restrict livestock from the project area would allow existing and reclaimed vegetation to regenerate more quickly.

The proposed action may affect, but is not likely to adversely affect the yellow-billed cuckoo. The proposed action would have no effect on proposed critical habitat for this species.

Chiricahua Leopard Frog

Direct effects to Chiricahua leopard frog may include harm, harass, pursuit, capture, and may include incidental mortality when individuals in all life stages are removed from the project area prior to construction and released out of the action area or to undetected individuals that are not captured or removed from the action area. Conservation measures are included as part of the action to minimize adverse impacts to frogs during the project activities and primarily include capturing and moving as many individuals as possible out of harm's way that would otherwise result from the action, and thus will result in take. The conservation measures that are part of the proposed action will minimize take during implementation of the project. Decreased water quality during construction and harm, harass, injury, or death may occur to individuals not removed from the project area. Indirect effects to this species may include mortality from the introduction of diseases and long-term beneficial effects from habitat improvements..

During construction, harm, harass, injury or mortality could occur from heavy equipment, vehicle traffic, soil disturbance, and human activity to those individuals not captured and removed from the construction area. Conservation measures to reduce the number of individuals in the construction area include collection and removal of frogs prior to breeding, and collection and removal of all life stages present prior to construction. The movement of animals prior to breeding will limit the amount of tadpoles in the action area, reducing the number of mortalities in the action area. Electrofishing techniques will be used to capture and remove Chihuahua chub from the action area, and may be used as a technique to locate and captures any remaining frogs pre-construction. These conservation measures are anticipated to greatly reduce the risk of mortality during construction. The NMDGF will coordinate with the USFWS when surveying and relocating individuals from the project area, and will use well-trained staff following the protocol outlined in the Chiricahua Leopard Frog Recovery Plan to reduce the risk of mortality to individuals during collection and transport. Some individuals will remain undetected or uncaptured. This is typically about 10% of individuals present. Adults or tadpoles not collected may disperse from the area decreasing the risk of direct mortality, but some may still get injured or killed through crushing during construction.

The proposed action could adversely affect Chiricahua leopard frog by introducing diseases that could result in mortality. Imported materials and plants could result in the introduction of *Batrachochytrium dendrobatidis* (*Bd*), or other pathogens of concern. There could be the potential to transport disease during relocation and repatriation; however, *Bd* is known to be present throughout the Mimbres drainage and the proposed frog translocations are well within the reasonable frog dispersal distances, and thus, are not likely to contribute to the spread of existing pathogens present in the action area. Conservation Measures listed in Section 3.1.2 will be implemented to avoid introducing Ranavirus, novel strains of *Bd*, or other pathogens into the project area. These Conservation Measures include using woody materials and boulders from the Mimbres watershed or upland sources, removing all debris from equipment, steam cleaning construction equipment and utilizing seed sources and willows from on-site to revegetate the project area. Therefore, it is unlikely that disease will be introduced or spread as a result of the action.

Installation of BMPs will minimize or eliminate the potential for increased sedimentation from upland sources or accidental hazardous spills in the Mimbres River that could result from construction activities. Construction activities within the Mimbres River channel may cause short-term increases in turbidity in the downstream action area. Increases in turbidity may cause adult individuals to avoid the downstream action area during short-term pulse events. Increases in turbidity

may also reduce the availability of food resources for larvae and may smother egg masses within the action area (SESAT 2008). However, the Chiricahua leopard frog evolved in highly turbid systems, egg masses and breeding individuals will be relocated from the construction area, and breeding is not likely to occur in the action area. We anticipate that sedimentation will be temporary in duration and will not have significant impacts to Chiricahua leopard frogs.

It is anticipated that the proposed action will have long-term indirect beneficial effects to Chiricahua leopard frog. Backwater refugia ponds and associated wetlands created during the proposed action should provide an additional 0.25 acre (0.1 hectare) of habitat for this species in the project area (0.19 acre [0.07 hectare] from refugia ponds and 0.06 acre [0.02 hectare] of created wetlands). When established, riparian vegetation planted at refugia ponds and on the riverbank will provide overhanging vegetation, habitat heterogeneity, and escape cover. It is anticipated that the proposed action will result in additional habitat for egg deposition, tadpole and adult thermoregulation sites, and foraging sites. In-stream channel structures will create refuge sites and potential hibernacula.

Effects of the proposed action refers to the direct and indirect effects of an action on the species, 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.

The proposed action may affect, and is likely to adversely affect Chiricahua leopard frog. Overall, and in the long-term, it is anticipated that the frog will benefit from the proposed activities from improved habitat conditions; however, there may be short-term adverse impacts. This project is considered a recovery action for the frog by restoring and improving habitat for frogs along the Mimbres River.

Chiricahua Leopard Frog Critical Habitat

There is no effect to designated critical habitat.

Chihuahua Chub

Direct effects to Chihuahua chub may include harm, harass, pursuit, capture, and incidental mortality when individuals are removed from the project area prior to construction and released out of the action area or to undetected individuals that are not captured and removed from the action area. Conservation measures are included as part of the action to minimize adverse impacts to chub during the project's activities and primarily include capturing and moving as many individuals as possible out of harm's way that would otherwise result from the action, and thus will result in take. The conservation measures that are part of the proposed action will minimize take during implementation of the project. In addition to take associated with moving individuals out of harm's way, the proposed project is scheduled to occur during the spawning season for the Chihuahua chub and direct impacts to Chihuahua chub may also include limiting or disrupting breeding opportunities this season. Indirect effects may include short-term reduced habitat quality due to increased sediment during construction and long-term beneficial effects from habitat improvements.

During construction harm, harass, injury or mortality could occur from heavy equipment, vehicle traffic, soil disturbance, and human activity to those individuals not captured and removed from the construction area. Injury or mortality may occur when individuals are collected and removed from the project area prior to construction and to individuals that remain within the action area during construction resulting from burial or crushing. The conservation measures are anticipated to greatly reduce the risk of mortality during construction by moving most or all of the chub out of harm's way. The NMDGF, with assistance from the USFWS, will remove Chihuahua chub from the project area. The NMDGF will coordinate with the USFWS when electrofishing and removing fish from the project area, and will use well-trained staff and protocols to reduce the risk of mortality to individuals during electrofishing and transport. Fish will be relocated upstream of the project area or to TNC McAnnally or Disert properties.

Based on recent stocking and survey data for the action area, there are likely to be few chub present in the action area. In December of 2013, 2,500 hatchery Chihuahua chub were released into the action area; in the following April, 10 chub were observed, and in following October, 5 chub were observed (NMDGF 2015). In 2015, 4,000 chub were released approximately 4.5 miles upstream to The Nature Conservancy McAnnally property and most recently, in April 2016, 7 chub were observed in the action area (A. Monie (NMDGF), pers comm.). Limited quality habitat may be a factor in the successful establishment of released Chihuahua chub. Based on these data, we anticipate that the number of

Chihuahua chub in the action area will be low, and the likelihood of fish moving back into the action area will also be low because they will be released into high quality chub habitat away from the action area. Once pre-construction efforts locate and remove chub, it is anticipated that only a very few Chihuahua chub may remain in the action area.

While the proposed project is scheduled to occur during the spawning season for the Chihuahua chub and direct impacts to Chihuahua chub may include limiting or disrupting breeding opportunities during this season; effects to reproductive output in the action area are not expected. Data from stocking and subsequent surveys suggest that breeding is not occurring in the action area. Little is known about the reproductive needs for Chihuahua chub.

The use of BMPs will minimize or eliminate the potential for increased sedimentation from upland sources or accidental hazardous spills that could result from construction activities. Construction activities within the Mimbres River may cause short-term increases in turbidity in the downstream action area.

Implementation of proposed BMPs and compliance with section 401 and 404 permit conditions will reduce potential adverse impacts. The potential negative impact will be 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. The downstream turbidity is not expected to cause mortality to either fish or invertebrates. It would likely cause a slight incremental increase in embeddedness at downstream locations. However, we anticipate the impacts of this increase will be minor. Short-term increases in turbidity downstream during pulse events is not anticipated to have significant effects to Chihuahua chub that may be present downstream of the construction site as the species is adapted to high turbidity.

It is anticipated that indirect effects to Chihuahua chub will be beneficial by improving habitat within approximately 4,500 feet (1,371 meters) of the Mimbres River and creating additional habitat. In-channel features will be installed to stabilize the riverbank, create scour pools and other habitat structures. The proposed action will create five backwater refugia ponds, which are important habitat features for the Chihuahua chub life stages. The creation of the backwater refugia ponds with channel outlets would create an additional 0.19 acre (0.07 hectare) of habitat outside of the river channel. It is also anticipated that when established, riparian vegetation planted at refugia ponds and on the riverbank will provide overhanging vegetation and escape cover. By realigning the river channel, the proposed project should also re-establish hydrological processes that should result in stabilization and meandering of the channel and establishment of riparian

vegetation in the project area. Fencing the project area to eliminate livestock access will result in long-term beneficial effects to water quality, streambank vegetation, and other habitat features.

In the unlikely event that chub are still present after removal efforts in the action area, they could be killed or injured due to restoration activities of work roads, excavation and habitat modification (placement of wood debris), as well as during preconstruction fish removal. It is possible that the heavy equipment could crush chub, although the likelihood of this occurring is very low. Because recent surveys within the action area have found very few chub the probability that any fish would be directly impacted by the heavy equipment is reduced.

The action area may have a limited food source for fish until the habitat is fully recolonized by invertebrates. Because chub may depend on aquatic invertebrates as a major food source, the disturbed action area may have a short term impact of approximately 6 months on the food supply until the channel is fully recolonized. The Project actions may temporarily increase food supply to downstream invertebrate-eating species, including chub. Suitable physical habitat will be created for chub in the restored project area, but insufficient food could be available to the species for several months. Consequently, we anticipate a short-term degradation of habitat preceding the long-term improvements to habitat.

Effects of the proposed action refers to the direct and indirect effects of an action on the species, 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.

The proposed action may affect, and is likely to adversely affect Chihuahua chub. Overall. In the long-term, it is anticipated that the chub will benefit from the proposed activities from improved habitat conditions; however, there may be some short-term adverse impacts. This project is considered a recovery action for the chub by restoring and improving habitat for chub along the Mimbres River.

VII. Cumulative Effects

Cumulative effects include the effects of future State, tribal, local, or private

actions on endangered species that are reasonably certain to occur in the action area considered in this consultation. Future Federal actions that are unrelated to the actions are not considered because they require separate consultation pursuant to section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. § 1534 et seq.) (Act).

Private parcels within frog and chub habitat are predominantly in a rural setting, are not expected to experience sudden changes in private land road density, vehicular traffic, and habitat loss. The action area is on State owned land, with an interest in chub and frog conservation and no sudden changes in management affecting the frog are anticipated. No other known State, tribal, local, or private actions are reasonably certain to occur, therefore, cumulative effects are not anticipated.

Cumulative effects from climate change are expected. Periods of drought in the Southwest are common, but the frequency and duration of dry periods may be altered by climate change. Anthropogenic climate change, and associated effects on regional climatic regimes, are not well understood, but the predictions for the Southwest indicate less overall precipitation and longer periods of drought. The frog and chub, along with their habitat, will almost certainly be affected in some manner by climate change; the magnitude and extent of the change cannot be quantified at this time.

VIII. Conclusion

“*Jeopardize the continued existence of*”, is defined as, to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02). Recovery calls for improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4(a)(1) of the Act (50 CFR § 402.02).

Chiricahua Leopard Frog

After reviewing the current status of the frog, the environmental baseline for the action area, the effects of the proposed action, it is the Service’s opinion that the project, as proposed, is not likely to jeopardize the continued existence of the threatened frog. Consequently, we do not expect the effects of the proposed action to impede the survival or recovery of the frog. We make these findings for the following reasons:

1. The Service has based this determination that the project is for the benefit of the frog and will improve its habitat, and provide additional opportunities for breeding and overwintering.
2. The proposed action will occur within a relatively small portion of the species' entire range. Although take of frog from project implementation is likely, the anticipated level is small in proportion to range-wide population.
3. Breeding and overwintering habitat is currently limited in the action area, and thus few individuals currently occupy the action area.
4. It is anticipated that the project will only temporarily affect the individuals within the action area. The project is unlikely to affect overall reproduction, numbers, and distribution of the species at the site or overall.
5. It is anticipated that the project will have long-term benefits for the species and will allow for more individuals to utilize the area year round.
6. We do not believe the likelihood of survival and recovery of the frog will be compromised due to the implementation of the proposed action because the activity will promote improved habitat quality and quantity.

Chihuahua Chub

After reviewing the current status of the chub, the environmental baseline for the action area, the effects of the proposed action, it is the Service's opinion that the project, as proposed, is not likely to jeopardize the continued existence of the threatened chub. Consequently, we do not expect the effects of the proposed action to impede the survival or recovery of the chub. We make these findings for the following reasons:

1. The Service has based this determination that the project is for the benefit of the chub and will improve its habitat.
2. The proposed action will occur within a relatively small portion of the species' entire range. Although take of chub from project implementation is likely, the anticipated level is small in proportion to range-wide population.

3. The project will likely only temporarily affect the individuals in the immediate construction area within the action area. The project is unlikely to affect overall reproduction, numbers, and distribution of the species at the site or overall.

4. We do not believe the likelihood of survival and recovery of the chub will be compromised due to the implementation of the proposed action because the activity will promote improved habitat quality.

Incidental Take Statement

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined (50 CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

Amount or Extent of Take

Chiricahua Leopard Frog

Despite the provisions for safe capture, holding, and release frogs away from the construction area, there is always a risk of mortality when handling any stage of the frog in these situations. Incidental take is reasonably certain to occur and is expected to be in the forms of harm, harassment, pursuit, trap, capture, and may include some mortality resulting from the effects of the proposed action on frogs. Because in general, frog occupancy at any given site is changing over time through immigration, emigration, and reproduction; and individuals are difficult to detect because the species is small-bodied, well-camouflaged, and occurs under water of

varying clarity; it is not possible to accurately determine the number of individuals that may be present in the action area at any given time.

The project is anticipated to improve habitat for the existing frog population, and thus frogs are expected to be present in the action area. However, the number of frogs occupying the action area is expected to be relatively low due to current habitat conditions. We anticipate that the majority of take will be in the form of harassment (resulting from pursuit, trapping, capture, and relocating). We anticipate that all individuals that are detected in the action area will be harassed and that some individuals may not be detected or captured and have the potential to be injured or killed from crushing or burial. We anticipate that any incidental take of frogs from crushing or burial during construction will be difficult to detect because finding a dead or injured specimen is unlikely, as they are small bodied and camouflaged. Although we cannot determine or estimate the number of individual frogs or individuals that will be incidentally taken through crushing or burial, based on previous captures and habitat complexity, we can estimate the percentage of individuals present by life stage that will be detected and captured. Therefore, based on previous experience and habitat complexity within the action area, we estimate that less than 10 percent of the metamorphosed individuals present will not be detected or captured. Because efforts will be made to relocate frogs prior to breeding, we anticipate the presence of egg masses to be low, or detected upon pre-construction surveys. Capturing tadpoles present is expected to be more difficult than capturing metamorphosed frogs or observing egg masses, thus the effort to minimize the presence of tadpole in the action area. However, the multiple survey efforts, using multiple techniques, will remove as many tadpoles as possible, and reduce the likelihood of tadpoles being in the actions area. We estimate that at least 70 percent of tadpoles present will be captured and temporarily held or moved out of harm's way. This estimate is based on approximately 95 percent capture rates using a seine in an enclosed steel tank, and the employment of multiple efforts with multiple techniques. Furthermore, it is unlikely that all individuals not detected and captured pre-construction will be injured or killed from construction. Therefore, we anticipate that most (greater than 90 percent) of metamorphosed individuals present, most (90% or greater) egg masses present, and greater than 70 percent of tadpoles present will not be injured or killed from the action, will be relocated nearby, and may disperse back to improved habitat.

We do not anticipate any mortality of adult, sub-adult, juvenile frogs, late-stage tadpoles, or egg masses during temporary holding, but recently metamorphosed frogs and small tadpoles may be more susceptible to injury or mortality from pursuit, handling, and holding. However, injury or death can occasionally occur

during capture of any stage individuals, and injured animals could be prone to mortality during holding. In summary, we anticipate more than 90 percent of frog-form individuals present, more than 70 percent of tadpoles present, and at least 90% percent of eggs present to be captured and relocated nearby. It is unknown how many of those that are not captured or moved out of harm's way will be injured or killed by the action, but it will be less than 100 percent of those not captured.

Further, we do not anticipate injury or death to exceed 10 percent of any life stage, by stage, of those captured and temporarily held (e.g. less than 10 percent of adult, sub-adult, and juvenile frogs captured; less than 10 percent of recently metamorphosed frogs captured; less than 10 percent of tadpoles captured; and less than 10 percent of eggs handled). Overall, we estimate the amount of injury or death to be less than approximately 10 percent of the population.

In summary, we anticipate take could occur in the following ways:

1. 100 percent of all stages of frogs present will be harassed through pursuit.
2. 90-100 percent of frogs and eggs present and more than 70 percent of tadpoles present will be harassed through capture and relocation. There is a low probability that handling frogs or tadpoles will lead to their death, but injury is possible.
3. A small percentage of frogs (up to 10 percent) and tadpoles (up to 30 percent) may be missed during the pre-construction capture efforts and be harmed, harassed, injured, or killed by crushing or burial.
4. Electroshocking may temporarily stun, injure a few frogs and/or tadpoles.

Chihuahua Chub

Based on the best available information for chub, the habitat needs of this species, the project description, and information provided in this intra-service consultation, incidental take is reasonably certain to occur and is expected to be in the forms of harm, harassment, pursuit, trap, capture, and may include some injury or mortality resulting from the effects of the proposed action on chub. We expect a low likelihood of chub being present during construction activities due to the low occupancy rate of chub and removal efforts in the action area. Although the number of chub present in the action area is low, we anticipate that 100% of those

present will be harassed through pursuit, trap, capture, relocation. Harassment may also occur through displacement from optimal habitat, reduction in prey base, and handling during removal efforts. We anticipate that removal efforts prior to restoration activities in the action area combined the existing low numbers of chub within the action area prior to removal will result in very few to no individuals present in the action area during construction. Harm or death due to vehicular use or heavy equipment will be rare. However, it is possible there may be a few undetected individuals remaining in the action area. Based on previous captures and habitat complexity, we anticipate that the number of chub remaining in the action area and subject to injury or mortality from crushing or burial will very low. However, we anticipate that any incidental take of chub from crushing or burial during construction will be difficult to detect because finding a dead or injured specimen is unlikely, as they are relatively small bodied and will blend in during construction activities. As such, we quantify the take in terms of habitat impacted. It is estimated that harm of chub will occur over approximately 1.5 ha (3.7 acres). The linear distance for this area is approximately 1,273 meters (4,200 feet).

Effect of Take

Chiricahua Leopard Frog

In this biological opinion, we determine that this level of anticipated take is not likely to result in jeopardy to the frog. While the proposed action may adversely affect the frog in the short-term through the loss of individuals of various life stages through any of the forms of incidental take described above, we anticipate injury and mortality to be a relatively small percentage of individuals present, and that the action will have both short- and long-term benefits for the frog.

Chihuahua Chub

In this biological opinion, we determine that this level of anticipated take is not likely to result in jeopardy to the chub. While the proposed action may adversely affect the chub in the short-term through relocation of a small number of individuals out of the action area and in the forms of incidental take described above, we anticipate injury and mortality to be small, have quantified it in term of habitat to be approximately 1.5 ha (3.7 acres) with a linear distance for this area of approximately 1,273 meters (4,200 feet). We anticipate the action will have short-term adverse effects to habitat but long-term benefits for the chub.

REASONABLE AND PRUDENT MEASURES

No reasonable and prudent measures are necessary for the action addressed in this biological opinion. The effort to capture and keep frogs and chub out of harm's way will minimize take from construction activities, and the frog and chub will receive long-term benefit from the proposed habitat improvements.

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, 4901 Paseo del Norte NE, Suite D, Albuquerque, New Mexico, 87113, telephone (505) 248-7889, 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 if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to the NMESFO. Care must be taken in handling sick or injured animals to ensure effective treatment and in handling dead specimens to preserve the biological material in the best possible state. If possible, the remains of intact species shall be provided to the NMESFO. If the remains of the species are not intact or are not collected, the information noted above shall be obtained and the carcass left in place. Injured animals should be transported to a qualified veterinarian by an authorized biologist. Should the treated species survive, contact our office regarding the final disposition of the animal.

CONSERVATION RECOMMENDATIONS

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

1. We recommend that the Service's State Wildlife Program continue to work with New Mexico Department of Game and Fish and continue to support opportunities to improve or restore frog and chub habitat.

REINITIATION NOTICE

This concludes formal consultation on the action outlined in this biological opinion. As provided in 50 CFR Section 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 that was 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.

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VIII. Effect determination and response requested:

Determination

Response requested

- A. Listed species/designated critical habitat: may affect, is not likely to adversely affect

Species: southwestern willow flycatcher

X_Concurrence

- B. Listed species/designated critical habitat: may affect, likely to adversely affect

Species: Chiricahua leopard frog

X_Formal

Species: Chihuahua chub

X_Formal

- C. Proposed species/proposed critical habitat: may affect, is not likely to adversely affect

Proposed species: Yellow-billed cuckoo

X_Concurrence

Susan H. H. H.

April 25, 2016

Signature

Date

IX. Reviewing Ecological Services Office Evaluation:

A. Concurrence _____ X _____ Non-
concurrency _____

B. Formal conference included

Signature

Date

Field Supervisor, New Mexico Ecological Services Field Office

