March 8, 2019

Cons. No. 02ENNM00-2017-F-0059
NMDOT Control No. A300423

Gregory L. Heitmann, Environmental Specialist
Federal Highway Administration, New Mexico Division
4001 Office Court Drive, Suite 801
Santa Fe, New Mexico 87507

Dear Mr. Heitmann,

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973 (16 USC 1531-1544), as amended (ESA). The U.S. Department of Transportation Federal Highway Administration (FHA) and New Mexico Department of Transportation (NMDOT) Biological Assessment (BA; Frye and Herring 2018), dated March 2018, involves the proposed construction of a new bridge and removal of an existing bridge on New Mexico Highway 6 (NM 6) over the Rio Grande in the Village of Los Lunas, Valencia County, New Mexico (Proposed Action). At issue are impacts that may result from FHA and NMDOT’s Proposed Action. You determined the Proposed Action “may affect, likely to adversely affect” the Rio Grande silvery minnow (*Hybognathus amarus*; silvery minnow) and designated critical habitat for the species. You also determined the Proposed Action “may affect and is not likely to adversely affect” the southwestern willow flycatcher (*Empidonax traillii extimus*; flycatcher), its designated critical habitat, the western yellow billed cuckoo (*Coccyzus americanus*; cuckoo) and its proposed critical habitat.

We concur with the determination of “may affect, not likely to adversely affect” for the flycatcher, cuckoo and their designated or proposed critical habitat based on information provided by the BA as well as our understanding of your project:

- Vegetation removal will occur outside of migration and nesting season.
- Trees and willows removed during construction will be replanted as part of the revegetation activities.
- There are no know territories of the flycatcher or cuckoo within the action area.
Your BA also addressed three additional species and critical habitat where "no effect" determinations were made. The ESA does not require Federal Agencies to consult on projects determined to have "no effect" on listed species or designated critical habitat.

The enclosed biological opinion (Opinion) for the silvery minnow is based on information provided in your March 15, 2018 BA, a site visit project discussion on July 18, 2018, plan sheets (proposed silvery minnow mitigation, bank taper and bridge footprint) sent via email on September 25, 2018 and other sources of information. In this Opinion, we analyzed the status of the silvery minnow, the environmental baseline, effects of the Proposed Action, and cumulative effects. Based on our analyses, we found that the Proposed Action will not jeopardize the silvery minnow. Based on the 0.25 acres of the offsetting habitat enhancements, we also found that the Proposed Action will not destroy or adversely modify designated critical habitat for the silvery minnow. Literature cited in this Opinion is not a complete bibliography of all literature available on silvery minnows, their habitat, or on potential effects to the species considered in this Opinion. A complete administrative record of this consultation is on file at the Service’s New Mexico Ecological Services Field Office (NMESFO).

Thank you for working with the Service to address our project concerns and seeking to enhance and create habitat features associated with the Proposed Action. In future correspondence on this project, please refer to consultation number 02ENNM00-2017-F-0059. If you have any questions regarding this Opinion, please contact Clinton Smith, at the letterhead address, by email, at clinton_smith@fws.gov, or by telephone at (505) 761-4743 or David Campbell at the letterhead address, by email, at david_campbell@fws.gov, or by telephone at (505) 761-4745.

Sincerely,

Shawn Sartorius
Field Office Supervisor
cc: (electronic copies)

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Administrative Record Consultation No. 02ENNM00-2017-F-0059 (Clinton_Smith@fws.gov)
BIOLOGICAL OPINION ON THE PROPOSED NEW MEXICO 6 NEW BRIDGE CONSTRUCTION AND EXISTING BRIDGE REMOVAL ON THE RIO GRANDE, VILLAGE OF LOS LUNAS, VALENCIA COUNTY, NEW MEXICO

Consultation Number 02ENNM00-2018-F-0059

February 25, 2019

Shawn Sartorius
NMESFO Field Supervisor
**BIOLOGICAL OPINION**

**I. DESCRIPTION OF THE PROPOSED ACTION**

**Action Area**

The proposed project is located in the San Clemente Land Grant in an un-sectioned portion of Township 7 North, Range 2 East, New Mexico Principal Meridian (Figure 1). The proposed project will involve replacing Structure 7453 with a new bridge on a curved alignment north of the existing bridge (Figure 2). The project area is located within the Middle Rio Grande Valley floodplain within the Isleta Reach. The “Isleta Reach” includes the channel and floodplain (between the levees or high ground) of the Rio Grande River between the Isleta Diversion Dam and San Acacia Diversion Dam. The proposed action will take place within the Isleta Reach of the Rio Grande.

The Action Area includes all areas that will be affected directly or indirectly by the proposed action (50 CFR 402.02). The Service finds that the Action Area includes those areas of disturbance associated with the proposed action at, below and near the NM 6 bridge, and any areas downstream in which mixing may occur due to water quality alterations. The Action Area includes areas of earthwork, the staging area, access roads and haul routes, areas where vegetation would be mowed or removed, fill material or sediment disposal areas, as well as areas where noise, shading, other habitat disturbances, or water quality changes that may occur (adjacent to the construction sites or downstream into a zone of mixing (dilution), as identified by the wetted impact acreage), all areas of activity associated with habitat enhancement activities, or any areas associated with the contracted work, installation of the silt fences, temporary fills, and piers. For this project, the action area includes a 61-meter (200-foot) buffer around the project footprint (work area) within the Rio Grande and its floodplain. Additionally, the action area extends approximately 0.8 kilometer (0.5 mile) downstream of the project area within the Ordinary High Water Mark (OHWM) of the Rio Grande.

**Proposed Actions**

**NM 6 Bridge Construction Activities**

The proposed bridge cross section will have four 3.3-meter (11-foot) wide lanes, a 3.0-meter (10-foot) wide median, two 1.8-meter (6-foot) wide outside shoulders, concrete wall barrier, 1.8-meter (6-foot) wide sidewalks on either side of the bridge, and open railings along the outside of the bridge. The proposed bridge is designed to have eight 35.0-meter (115-foot) long spans, with a total bridge length of approximately 288 meter (945 feet) from edge of abutment to edge of abutment. The proposed roadway cross section for the approaches to the bridge will have four 3.3-meter (11-foot) wide lanes, a 4.3-meter (14-foot) wide median, 1.8-meter (6-foot) wide shoulders, curb and gutter, and 1.5-meter (5-foot) wide sidewalks. Roadway reconstruction for the approaches is expected to extend from the NM 6/Calle de Wences intersection on the west side of the river to the Riverside Drain access road on the east side of the river. The design will include an at-grade pedestrian crossing on the east side of the river. The new bridge will improve access for pedestrians and bicyclists, and will improve access to Riverside Park.
All construction activities are collectively considered a single project; however, construction will be completed in seven sequential phases with Phases 1, 2, 6, and 7 requiring temporary diversions of the river (see Frye and Herring 2018). The current phasing plan is preliminary and presented for the purposes of evaluating potential environmental impacts. Phasing could be contingent upon environmental parameters (seasonal high flows, migratory bird season, etc.). Final construction phasing will be determined by the contractor during construction. A description of the preliminary phasing plan is provided below:

- **Phase 1** will include installation and removal of a temporary diversion barrier along the east side of the river to allow installation of the piers and beams for the proposed bridge within the OHWM along the east side of the river.

- **Phase 2** includes installation and removal of a temporary diversion barrier along the west side of the river to allow installation of the piers and beams for the proposed bridge within the OHWM to complete the spans over the active channel. *(The addition of piers as permanent fill materials within the OHWM would affect silvery minnow critical habitat. The amount of permanent fill from two full piers and a pier with four of five pier drill shafts would total 0.002 hectare (ha) [0.007 acre].)*

- **Phases 3 and 4** could be completed concurrently and includes installation of the piers, beams, deck, and approaches for the east and west sides of the river outside of the OHWM. *(Four full piers and a pier with one pier drill shaft would be located within palustrine scrub-shrub wetlands resulting in permanent impacts to approximately 0.04 ha [0.010 acre] of silvery minnow critical habitat.)*

- **Phase 5** involves relocating utilities from the existing bridge to the new bridge.

- **Phase 6** includes installation and removal of a temporary diversion barrier along the east side of the river to accommodate removal of the existing bridge.

- **Phase 7** includes installation and removal of a temporary diversion barrier along the west side of the river, also to accommodate removal of the existing bridge.

Each of the proposed temporary diversion barriers will constrict the river flow; hydraulic modeling was used to characterize river conditions for the most restrictive of the diversions, Phase 7. While the diversion is in place:

- Channel flow capacity will be reduced by approximately 26.5 cubic meters per second (cms) (937 cubic feet per second [cfs]).

- Water surface elevation is expected to rise 0.04 meter (0.15 feet) from an elevation of 1,479.18 to 1,479.22 meter (4,852.95 to 4,853.10 feet) above mean sea level.

- Water velocity would increase 0.76 meter per second (mps) (2.49 feet per second [fps]), from 1.14 to 1.9 mps (3.73 to 6.22 fps).

These diversions are be scheduled to occur during the Rio Grande’s low-flow period, traditionally from October 15 to March 15. Diversions would likely be in place over the course of two low-flow seasons. The Phase 1 diversion is anticipated to take up to 2 months and the Phase 2 diversion would take approximately 3 months. In the following year, both the Phase 6
and Phase 7 diversions are anticipated to be in place for approximately 1 month each. If work within the OHWM from the first two phases is not fully completed, it would also be finalized in the second low-flow season; however, only one diversion would be in place at a time.

Much of the construction will be completed with tracked and rubber-tired vehicles (bulldozers, backhoes, front-end loaders, etc.). Equipment will enter the active river channel only after the temporary diversions have been established and would be limited to the area behind the diversion. Additionally, channel disturbing construction activities will be limited to winter months when flows are typically reduced and, on average, do not exceed 17.0 cms (600 cfs). Assuming an average flow of 17.0 cms (600 cfs) for the duration of the in-channel construction, dilution and mixing of any release of chemicals or excessive sediments will be lessened compared to higher flows, and little input from tributary arroyos would be expected.

Elevated turbidity in the Rio Grande may occur downstream of the proposed project because of the need to divert flows; install temporary access fill and excavate soils during pile driving and capping for piers; and the need to use heavy equipment in and adjacent to the channel. The potential for increased turbidity downstream would most likely occur during construction activities within the OHWM of the Rio Grande.

**NM 6 Existing Bridge Deconstruction Activities**

The existing bridge on NM 6 was built in 1974, is structurally deficient, and is nearing the end of its 50-year design life. The bridge was rehabilitated in 2013 to extend its life until it could be replaced. The existing bridge is structurally deficient due to the poor foundation and girder condition. There is a need for a bridge that meets current design and safety standards and also addresses adopted transportation plans and policies for the region.

**Vegetation Affected by the Proposed Action**

The vegetation within the survey area (Smith and Herring 2018) is characteristic of a floodplain riparian community (bosque) with hydrology, soils, and altered ecological processes within the Rio Grande drainage system. Mature cottonwood galleries are found within the Action Area. There is a significant mid-story and understory component beneath the cottonwood canopy comprising a variety of native and non-native trees, shrubs, grasses and forbs such as yerba mansa (*Anemopsis californica*), water birch (*Betula occidentalis*), whitetop (*Cardaria draba*), Russian olive (*Elaeagnus angustifolia*), white mulberry (*Morus alba*), skunkbush sumac (*Rhus trilobata*), coyote willow (*Salix exigua*), salt cedar (*Tamarix ramosissima*), and Siberian elm (*Ulmus pumila*). This vegetation generally occurred along the upper banks of the river channels or in the surrounding uplands. The lower banks of the channels usually support patchy, dense stands of spiny cocklebur (*Xanthium spinosum*), curly dock (*Rumex crispus*), and hydrophilic graminoid species, such as cattail (*Typha latifolia*), rushes (*Juncus spp.*), Emory’s sedge (*Carex emoryi*), saltgrass (*Distichlis spicata*) and knotgrass (*Paspalum distichum*). Lower banks also support palustrine scrub-shrub wetlands containing coyote willows interspersed with common reed (*Phragmites australis*), salt cedar, and willow baccharis (*Baccharis salicina*).
Wetlands Affected by the Proposed Action

The biological reports provided for this NM 6 bridge project (Frye and Herring 2018; Smith and Herring 2018) quantified and referred to acres of wetlands impacted by the Proposed Action. Temporary wetland impacts from the proposed action include approximately 0.20 ha (0.50 acre) of habitat within the OHWM during construction of the new bridge (Frye and Herring 2018). Approximately 0.65 ha (1.60 acre) of palustrine scrub-shrub wetlands will also be impacted during construction of the new bridge. Temporary fill may be needed in the active channel for demolition of the existing NM 6 bridge. The temporary fill within the Rio Grande OHWM would encompass an area approximately 0.14 ha (0.35 acre). Approximately 0.61 ha (1.50 acres) of palustrine scrub-shrub wetlands would be temporarily impacted during bridge demolition. Upon project completion, the temporarily impacted wetland areas would return to preconstruction conditions.

NMDOT Proposed Silvery Minnow Habitat Enhancements

The Proposed Action will also include at a minimum 0.10 ha (0.25 acres) of silvery minnow habitat enhancements (Duncan 2018). NMDOT will contract earth moving activities to grub (reduce the elevation by excavation, redistribution, or removal of sediment) on the east bank within the footprint of the existing bridge, within the NMDOT right-of-way, only. Soil and vegetation will likely be removed from this area using heavy equipment (such as dozers, belly scrapers, excavators, backhoes, or trucks). Spoils will be transported outside the floodplain and stored at a secure upland location.

The area of lowered elevation on the east bank under the existing bridge, will increase this area subject to periodic flooding (Figure 3). The goal of this proposed enhancement item is to create shallow, flooded shelves, that can result in slow velocity areas that retain silvery minnow eggs (Porter and Massong 2006) and create warm, productive areas with cover, which foster silvery minnow larvae growth, development, and survival (Magana 2012). Additionally, any increase in the amount of inundation by spring runoff may encourage growth of native vegetation that could be subsequently used by listed bird species.

Conservation Measures

The FHA and NMDOT propose to implement the following conservation measures as part of its proposed action (Frye and Herring 2018; Smith and Herring 2018; Heitmann 2018).

- Vegetation removal will occur outside of the migratory bird nesting seasons (March 15 – September 15) to reduce potential for impacts to nesting birds (as well as silvery minnow spawning). Any vegetation removal during the migratory bird nesting season would only happen after a pre-construction breeding bird survey has been conducted. Should federally or state-listed bird species be detected or observed during surveys, the NMDOT would consult with the NMESFO or New Mexico Department of Game and Fish (where appropriate) about how to proceed.
- A stormwater pollution prevention plan will be prepared in accordance with the provisions of the National Pollutant Discharge Elimination System Construction General Permit issued by the U.S. Environmental Protection Agency, since the project will disturb more than 0.4 ha (1.0 acre).
• FHA, NMDOT or contractors will comply with Clean Water Act Section 404 permit conditions and Section 401 Water Quality Certification with Conditions
• Best management practices (BMPs) installed during construction would prevent erosion and avoid sediment loading from upland areas reaching the Rio Grande.
• Areas will be designated for equipment storage, maintenance, and refueling activities, and will maximize the distance from flowing water.
• Equipment will be inspected daily for leaks. Leaking equipment will not be used in or near any watercourse.
• The contractor will be required to provide a terrestrial and aquatic spill prevention and containment plan and employ workers trained in spill containment. The contractor will be required to notify the NMDOT immediately if a spill occurs.
• Construction within the channel will be limited to those months of low-flow conditions which, on average, occur from October through early March for this reach of the Rio Grande (USGS gauge 08331160 near Bosque Farms, 2007-2017). No work will be allowed within the river channel from April 1 through July 30 (which coincides with the spawning period for silvery minnow).
• Water flow in the river would be temporarily diverted to minimize downstream transport of sediment. Appropriate temporary erosion and sediment control measures (e.g., silt fences, hay bales, mulch socks, geotextile-lined jersey barriers) will be implemented prior to construction. All erosion and sediment control measures will be removed upon bridge construction completion.
• Temporary dredged soils will be stored in a protected location outside of the immediate floodplain to prevent accidental release of a large sediment load in the event of a high-flow.
• Temporary dredged soils will be protected from pollutants before they are returned.
• The USFWS NMESFO and the US Army Corps of Engineers (Corps) will be notified if unexpected high flows occur during in-channel construction and if the resulting high flows result in the failure of erosion and sediment control measures.
• When using excavators to remove soil from wet areas, the contractor will tilt the bucket (after being raised above water levels) to drain water prior to placing soil onto land. This would allow the escape of any minnows caught (a rare phenomenon).
• If isolated pools form from surface flows during installation of in-channel construction features, stranded fish will be salvaged by permitted individuals and moved downstream outside of the construction area.
• Prior to its removal, the existing bridge will be cleared of swallow nests outside of the migratory bird nesting season. Exclusionary measures, such as netting, or regular removal of partially built nests will be used to prevent birds from nesting during demolition activities, should demolition occur during the migratory bird nesting season. If the Contractor’s nest exclusion measures fail and occupied nests are present, the contractor shall immediately notify the Project Manager.
• Demolition plans would include provisions to protect the Rio Grande during bridge removal, including measures to prevent material, equipment, and debris from falling into the water.
• The Rio Grande channel and banks will be re-contoured to pre-construction and pre-demolition conditions, except for the minnow mitigation pond.
• NMDOT will replace native plants at a ratio of 10:1, or 5:1 if original plants removed were particularly young, stressed, or diseased. NMDOT will coordinate with USFWS NMESFO on replanting efforts.

II. STATUS OF THE SPECIES

* * *

**Rio Grande silvery minnow**

The silvery minnow was federally listed as endangered under the ESA in 1994 (Service 1994). The silvery minnow is known to occur only in the Rio Grande in a 280-kilometer (174-mile) stretch of river that runs from Cochiti Dam to the headwaters of Elephant Butte Reservoir (Bestgen and Platania 1991; Dudley and Platania 2002). Its current habitat is limited to about five percent of its former range, and is split by three dams into four reaches. Additionally there is an introduced nonessential, experimental population that occupies two percent of the historic range in the Rio Grande near Big Bend, Texas (Service 2008). The silvery minnow is reported to live from 2 to 3 years (Horwitz et al. 2018). Adults in the wild generally spawn during an approximate 1-month period in late spring to early summer (May to June) in association with spring runoff when water temperatures are between 18 and 24 Celsius (°C) (64 and 75 Fahrenheit [°F]) (Platania and Dudley 2006; Turner et al. 2010). Silvery minnow is a pelagic spawner that produces thousands of semi-buoyant, non-adhesive eggs that passively drift while developing (Platania and Altenbach 1998). Silvery minnow larvae are most abundant in habitats with little or no flow and relatively high water temperature (Pease et al. 2006). Additionally, prolonged and elevated spring flows resulting in overbank flooding of vegetated areas and formation of inundated habitats, combined with the delayed onset of low flows, appear to ensure successful recruitment of silvery minnow larvae (Dudley et al. 2016).

Critical habitat for the silvery minnow was designated in 2003 (Service 2003a). Designated critical habitat extends 252 kilometer (157 mile) from the Cochiti Dam downstream to just north of Elephant Butte Reservoir, which equates to approximately 11,630 ha (28,738 acres). The silvery minnow has been extirpated upstream of Cochiti Reservoir (Service 2003a). The width of the critical habitat is defined as the area bound by existing levees; or, where no levees are present, as 91 meter (300 feet) of riparian zone adjacent to each side of the bankfull stage of the river channel.

The primary constituent elements (PCEs) of the silvery minnow critical habitat are those elements of the physical or biological features in an area that provide for life-history processes and are essential to the conservation of the silvery minnow. The PCEs listed in the critical habitat designation for the silvery minnow are:

1. A hydrologic regime that provides sufficient flowing water with low to moderate currents capable of forming and maintaining a diversity of aquatic habitats, such as, but not limited to, the following: backwaters (a body of water connected to the main channel, but with no appreciable flow), shallow side channels, pools (that portion of the river that is deep with relatively little velocity compared to the rest of the channel), and runs (flowing water in the river channel without obstructions) of varying depth and velocity – all of which are necessary for each of the particular silvery minnow life history stages in appropriate seasons (e.g., the silvery minnow
requires habitat with sufficient flows from early spring (March) to early summer (June) to trigger spawning, flows in the summer (June) and fall (October) that do not increase prolonged periods of low-or no-flow, and relatively constant winter flow (November through February);

2. The presence of eddies created by debris piles, pools, or backwaters, or other refuge habitat within unimpounded stretches of flowing water of sufficient length (i.e., river miles) that provide a variation of habitats with a wide range of depth and velocities;

3. Substrates of predominantly sand or silt; and

4. Water of sufficient quality to maintain natural, daily, and seasonally variable water temperatures in the approximate range of greater than 1 °C (35 °F) and less than 30 °C (85 °F) and reduce degraded conditions (e.g., decreased dissolved oxygen, increased pH).

For additional information pertaining to silvery minnow status, refer to the Service (1994; 2003a; 2003b; 2010a; 2010b; 2011a; 2011b; 2012; 2013a, 2013b; 2014; 2015; 2016; 2018) and US Bureau of Reclamation (Reclamation; 2015) as have both agencies have provided updates on the status of the silvery minnow including its description, life history, genetics, demography, habitat, distribution, threats of extinction, goals for recovery, and further detail associated with the physical and biological features of its critical habitat.

III. ENVIRONMENTAL BASELINE

Under section 7(a)(2) of the ESA, when considering the effects of the Proposed Action on federally listed species, the Service is required to take into consideration the environmental baseline. Regulations implementing the ESA (50 FR 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 already undergone formal or early section 7 consultation; and the impact of State and private actions that are contemporaneous with the consultation in process.

The Service (2003a; 2003b; 2010a; 2010b; 2011a; 2011b; 2012; 2013a; 2013b; 2014; 2015; 2016; 2018), the Corps (2007; 2012a; 2012b; 2012c), Reclamation (Makar 2015; Massong 2005; McMillan et al. 2016; Reclamation 2003; Reclamation 2015; Varyu 2013), and others (Crawford et al. 1993; Dudley et al. 2016; Geosystems Analysis 2015; Gunning 2010; Parametrix 2008; Posner 2011; Shah-Fairbank et al. 2011; Tetra Tech 2014) have described the environmental baseline, which encompasses the Action Area, and these are incorporated here by reference, as they inform the environmental baseline, the effects analyses, and the jeopardy analysis in this Opinion.

Generally, as a result of river management activities over the past 50 years, the Rio Grande in the Isleta Reach, particularly near the Action Area, has continued to degrade, separating the river channel from its associated riparian floodplain, which has reduced the areas of inundation and overbanking even at modest flows (Parametrix 2008; Isaacson 2009; Gunning 2010; Corps 2007, 2012a, 2012b, 2013; Shah-Fairbank et al. 2011; Service 2013b).
Hydrology in the Action Area

The Action Area is prone to annual flooding; however, climate, drought, and anthropogenic modifications affecting the middle valley have diminished a once dynamic alluvial environment. As a result, alluvial deposition within the survey area once subject to seasonal displacement and shifts, give rise to the development of other aquatic resources, such as palustrine emergent wetlands and palustrine scrub-shrub wetlands (Smith and Herring 2018).

The Rio Grande at this location has undergone historic management by the Corps and Reclamation, including dredging and channelization to manage flooding and streamflow. However, a review of historic aerial photography suggests no such recent activity (Frye and Herring 2018). Rather, a review of historic aerial photography suggests morphological changes within the active river bed including signs of aggradation over time near the Action Area.

Changes in the MRG magnitude, duration, frequency, and timing of water in the river can also be obtained from stream gauges. These gauges can be found throughout the MRG (13 are distributed from Cochiti Dam to the headwaters of the Elephant Butte Reservoir). The mean monthly discharge at the nearest upstream stream gage from the project area (near Bosque, NM; site 08331160) is displayed in Figure 4. The mean monthly discharge is the average streamflow in cubic feet/second by month. Based on data from 2010 to 2014, the mean monthly discharge ranged from 22.6 cms (799 cfs) in December to 3.8 cms (135 cfs) in June (Figure 4).

Unexpected Spills and Traffic Noise

Concerns exist with regards to potential petroleum spills (or other chemicals) from pipelines or during transportation in vehicles on bridges or by rail along and across the Rio Grande. Additionally, vehicle collisions as well as associated emergency response actions have the potential to release hydrocarbons, fuels, and other materials into the Rio Grande. Fuels, such as diesel, have documented toxicity to aquatic life due in part to semi-volatile compounds. For example, polycyclic aromatic hydrocarbons are known to occur during petroleum spills and may persist in contaminated sediments. Silvery minnows in the Rio Grande were found to contain up to five percent of hydrocarbons of petrogenic origin in their tissues (Lusk et al. 2012). These may be transported to fish tissues through foraging on contaminated sediments or prey where they can be toxic to fish (Eisler 1987; Schein et al. 2009). However, no incidental takes associated with these conditions were able to be quantified.

Traffic is steady and is the main noise source in the Action Area. Vehicles travel at speeds of 48 to 72 kilometers per hour (30 to 45 miles per hour), which result in traffic noise levels typically found in urban areas. As wildlife habitat, the Rio Grande is a sensitive receptor to noise impacts on fish and wildlife located adjacent to NM 6. The Service encourages some level of noise abatement mitigation such as sound barriers which would be appropriate to protect critical habitats within the floodplain.

Status of silvery minnow in Isleta Reach and Action Area

Life stages of silvery minnow currently inhabit the Isleta Reach on various days, and seasonally. Standard surveys of silvery minnows are routinely conducted at six discrete locations within the
Isleta Reach during long term monitoring (Dudley and Platania 2015; Dudley et al. 2016). Long-term, standardized monitoring of silvery minnows in the Middle Rio Grande (MRG) began in 1993 and has continued annually, except for portions of 1998, 2009, and 2013 (Dudley et al. 2016). Long-term monitoring of silvery minnows has recorded substantial fluctuations within one year (orders of magnitude increases or decreases) in the overall (MRG) population densities (an index of abundance for the silvery minnow population; Figure 5). Silvery minnow abundance is correlated with hydrologic conditions, particularly the magnitude, duration, and timing of spring runoff (Dudley et al. 2016). During spring runoff, inundated habitat in the floodplain is increased and, when sustained, provides additional areas for spawning adults, eggs, and larvae to nurse (grow, feed, shelter), such that annual silvery minnow abundance is observed to subsequently increase. There is also a negative relationship between low flow volumes and the distribution of silvery minnows (probability of occurrence of silvery minnow during sampling; that is, less water results in fewer occurrences of fish found during surveys). Thus, prolonged high flows during spring are most predictive of increased silvery minnow abundance and prolonged low flows during summer are most predictive of decreased silvery minnow occurrence at sites sampled over the 23-year study period (Dudley et al. 2016).

Dudley and Platania (2011) and Dudley et al. (2016) suggest that silvery minnows may shoal (swim in aggregations) and swim in pools, backwaters, and along the edges of the river, most likely reflecting preferences for different micro- and macro-habitat conditions (e.g., such as temperature, velocities, of food availability) throughout the river reach. Additionally, as silvery minnows move within and between locations in the Isleta Reach, there is the potential for fish to move into or near one of these sites while work is conducted. Although habitat conditions (e.g., substrate, velocity, depth, fish community, etc.) at or near the project area may differ from habitat conditions at the standardized survey sites, the Service assumes that silvery minnows occupy these sites at densities similar to those at the long-term survey sites. Therefore, for the period between September 2009 and October 2016, the Service summarized the available data on silvery minnow densities in the Isleta Reach collected during long term population monitoring (Dudley et al. 2016) by month (for those months occurring during the Proposed Action activities that may occur from July 16 through April 15; Smith and Lusk 2018).

For the purposes of this Opinion, the Service has used the average of the average monthly 85th percentile silvery minnow densities (expressed as “catch-per-unit effort” (CPUE) or number of silvery minnow per 100 square meter (silvery minnow/100m²)) from the last seven years of monitoring efforts in the Isleta Reach (Service 2018). That is, we used a density of 11.5 silvery minnow/100m² as representative of silvery minnow abundance within the Action Area. This estimated average density of 11.5 silvery minnow/100m² will be used to conservatively represent the status of the species for the duration of the Proposed Action, despite population fluctuations.
Status of silvery minnow critical habitat in the Isleta Reach

With the exception of the lands of the Isleta Pueblo (Service 2003b), the floodplain and river channel between the Isleta Diversion Dam to the San Acacia Diversion Dam is designated silvery minnow critical habitat. The critical habitat designation defines the lateral extent (width) as those areas bounded by existing levees or, in areas without levees, 91.4 meter (300 feet) of riparian zone adjacent to each side of the bank full stage of the MRG. The entire Action Area associated with the Proposed Action is located within designated critical habitat, and all PCE’s are currently present. The Service (2003b) found that the riparian zone adjacent to the river channel provided an important function for the protection and maintenance of the primary constituent elements and was essential to the conservation of the species.

Summary of the Environmental Baseline of Aquatic Habitat in the Action Area

The remaining wild population of silvery minnow is restricted to approximately seven percent of its historical range in the Rio Grande (Service 2010a). Several conditions in the environmental baseline have contributed to the current status of the silvery minnow and its habitat in the Action Area, and are believed to affect the survival and recovery of silvery minnows in the wild (Service 2016; 2018). Many of these activities are broader than the Action Area but have effects that extend into the Action Area. These include past and present projects that affect Rio Grande streamflow and riparian habitat such as water management, flood regulation, channelization, diversions for agriculture and drinking water, evaporation, climate change, land use changes, pollution, nonnative species invasion, ground water drainage, drought, salinization, and transbasin diversions of water (Service 2016; 2018). The reduction in the magnitude, frequency, duration, and timing of flooding (particularly overbank inundation of the floodplain during high spring flows) has disrupted the functional integrity of aquatic and riparian habitats in the Rio Grande and reduced the abundance of silvery minnow (Service 2016; 2018). Additionally, river drying events have negatively affected silvery minnow distribution, including documented mortality. Silvery minnows in the MRG are unable to expand their distribution because poor habitat quality, diversion dams, and reservoirs restrict significant movement (Service 2010a).

Augmentation of silvery minnows with captive-reared fish has been ongoing, and monitoring and evaluation of these fish provide information regarding the survival and movement of individuals, including those affected by river desiccation (Archdeacon 2014; Archdeacon et al. 2015). Habitat conservation and restoration, captive propagation and augmentation, genetics management, salvage and relocation, and research activities have been ongoing to reduce the risk of extirpation of silvery minnow in the wild.

IV. EFFECTS OF THE ACTION

Regulations implementing the ESA (see 50 CFR 402.02) define the effects of the action as the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, which will be added to the environmental baseline. Indirect effects are those that are caused by the Proposed Action and are later in time, but are still reasonably certain to occur. 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. The species that is likely to be adversely affected by the Proposed Action is the silvery minnow.
The Service expects an area of approximately 349 meter long by 83 meter wide or 29,040 meter$^2$ (1,145 feet long by 273 feet wide or 312,585 feet$^2$ [2.88 ha or 7.12 acres]) containing silvery minnows will be directly harassed by the Proposed Action (i.e. human activities, heavy equipment operations, noise, water quality mixing events, and any ancillary activities) described in more detail by Ecosphere (Frye and Herring 2018; Smith and Herring 2018). The Service assumes that the abundance of silvery minnows affected by the Proposed Action will be similar to the abundance of the silvery minnows found by silvery minnow population monitoring surveys conducted in the Isleta Reach over the last seven years (Dudley et al. 2016). Using an average (85th percentile) monthly, density of 11.5 silvery minnows/100m$^2$, then the number of silvery minnows potentially harassed or harmed within any month of activities is approximately (11.5 silvery minnow/100m$^2$ x 29.0/100 meter$^2$) 334 per month or about 14 silvery minnow per day. The Service has used this density of silvery minnows multiplied by the area of impact to determine the number of silvery minnows that are likely to be adversely affected by Proposed Action and in the Incidental Take Statement below. Should activities be sustained every day for ten months then (10 months x 334 silvery minnows = 100,200) up to 100,200 silvery minnows could be affected. However, activities are not proposed to occur in the river channel, or near the river's edge on a daily basis. Therefore, the Service will restrict the total potential incidental takes of silvery minnow to the monthly average of 334 silvery minnows. Should any event incidentally kill over 334 silvery minnows, then reinitiation of formal consultation with the Service may be warranted.

**Mechanical Activities, Vegetation Clearing, Water Quality Impacts, and Construction Noise**

Increased human and heavy equipment activity and noise may cause fish to avoid accessing the area for water, cover, and food. Solid waste disposal (plastics, debris) practices may also pose risks to other fish and wildlife. Silvery minnows would be impacted if occupying the river within or immediately downstream of the construction activities.

Construction activities will permanently remove approximately 1.1 ha (2.6 acres) of riparian vegetation for bridge and approach construction. Removal of riparian vegetation and dewatering will result in the permanent loss of less than 0.01 ha (0.01 acre) of wetlands and temporary impact to approximately 0.8 ha (2.1 acre) of wetlands. Deconstruction of the existing bridge will result in temporary impacts to approximately 0.6 ha (1.5 acre) of wetlands. Removal of upland and wetland vegetation will expose soils and increase erosion and sedimentation until vegetation is established in cleared areas. As a result, impacts to downstream water quality could adversely affect silvery minnows in the action area.

If equipment were to make direct contact with occupied river substrates, an unexpected release or petrochemicals, large volumes of slurry, or sediment were to occur during the activity then silvery minnows present in downstream waters could be impacted. If an unexpected release of petrochemicals or sediment were to occur during the activity, individual silvery minnows present at the site and in downstream waters could be exposed to and succumb to materials released. The extent of these impacts would be relative to the material and volume released. Because the activity is being conducted during the expected low-flow stream condition and construction measures will be implemented to reduce likelihood of water quality effects, the potential for effects is reduced. However, the potential for effects to occur is not discountable, since water would be diverted and fill would be installed; and unexpected flow surges or failure of Best
Management Practices (BMPs) would directly and immediately impact the river and aquatic life. In the event that a release of substances from the activities proposed were to occur and incidentally kill over 334 silvery minnows in a day, then reinitiation of formal consultation with the Service may be warranted.

Those silvery minnows that are startled and flee the construction noise, vibrations, and water quality alterations associated with the Proposed Action would be adversely affected. The Service assumed that the impact area was the width of the river times the length of 0.8 kilometers (0.5 miles). And we assumed that the average density of silvery minnows in that area that could be harassed or harmed by mechanical disturbance, noise, and water quality alterations when such activities happen would occur to silvery minnows along or near the shoreline. The maximum total number of silvery minnows that could be adversely affected by mechanical activities, noise and water quality alterations numbered 14 per day, using the assumptions stated above.

Bridge and Pier Construction

A minor but permanent impact to occupied critical habitat (0.01 ha [0.01 acre]) would result from the installation of the new bridge piers and abutments resulting in a change of substrate size and distribution from small, fine sediment, and gravel to cobble, rip rap, and cement piers. New bridge piers would be installed north of the existing bridge and bridge piers, and will provide support for the newly constructed structure. Two full piers and a pier with four of five pier drill shafts would be located within the OHWM; the amount of permanent fill within the OHWM would total 0.002 ha (0.005 acre). Four full piers and a pier with one pier drill shafts would be located within palustrine scrub-shrub wetlands resulting in permanent impacts to approximately 0.003 ha (0.008 acre). The pier installation and the pier installation fill activity temporary access would occur within occupied designated critical habitat. The 0.10 ha (0.25 acres) of habitat enhancements would create conditions favorable to recruitment that would offset this critical habitat impact.

Individual silvery minnows could be harassed (flee from and area avoidance) or harmed during temporary access construction (placement of jersey barriers and soils within the low-flow channel) and removal of this equipment; exposed to local increases in sediment (physiological stress, alteration of normal respiration); and via the operation of equipment near or in the channel-(by noise and vibrations).

Diversion of flows from construction sites could alter silvery minnow access to shelter and food sources and may entrap individuals. Diversion of flows, dewatering, pier construction, and need for equipment access would result in portions of the river being unsuitable to support established aquatic life for a five to ten month time period. Diversion of flows would temporarily affect silvery minnow habitat by increasing velocities and reducing the distribution and diversity of aquatic habitats in the Action Area.

Bridge Scour

The new bridge piers will cause localized scour in the river channel and in the floodplain (when inundated) (Romo 2018). We assumed that river bed scouring could occur near the piers approximately 24 meter (78 feet) long, 2 meter (6 feet wide), and 1 to 3 meter (2 to 10 feet) deep (468 feet²; 0.01 ha [0.01 acres]; 44 meter²). Assuming an average density of 11.5 silvery
minnows/100m², then as many as 5 silvery minnows per day will have lost slow velocity habitat within the Action Area. That project removes habitat for as many as 1,500 silvery minnows a year. For the duration of the project, 75 years, the potential habitat losses would have resulted in as many as 112,500 silvery minnows. We assumed those deep, scoured habitats would no longer provide the slow velocities necessary for silvery minnow habitat as well as potentially foster predatory fish capable of inhabiting these depressions. The 0.10 ha (0.25 acres) of habitat enhancements would create conditions favorable to recruitment that would offset this critical habitat impact.

*Silvery Minnow Habitat Enhancements proposed by NMDOT*

There were no independent assessments of the acres of silvery minnow habitat or critical habitat adversely affected. Therefore, the Service used the available information on acres of wetlands impacted, along with other estimates about the sizes of areas of adverse effects as a surrogate measure of the adverse effects to silvery minnows and designated critical habitat. The proposed action is anticipated to have beneficial effects on silvery minnows in the long-term by lowering the elevation of the east bank under the existing bridge thereby increasing the amount and frequency of floodplain inundation. The amount of floodplain inundation at this site without the Proposed Action doing additional habitat restoration is limited. When flows inundate the floodplain, low velocity conditions also promote silvery minnow egg retention in the floodplain and foster conditions that can produce larval silvery minnow food and cover and promote higher survival (Magana 2012).

The permanence of the habitat enhancements at this site in providing the physical features of silvery minnow egg and larval habitat over time is uncertain due to the dynamic features of a sand-bed river system. However, should the reduction of the elevation on the east bank under the new bridge (of 0.10 ha [0.25 acres]) last for approximately 10 years, then the habitat enhancement will be (0.25 acres x 10 years) 2.5 acre-year. Compare the habitat enhancement benefits with the permanent loss of approximately 0.01 ha (0.02 acres) critical habitat for up to 75 years (the duration of the bridge) (0.02 acres x 75 years) of 1.5 acre-years and it is clear that the habitat enhancements offsets the impacts over time. Additionally, these wetlands may provide a function of sediment and/or pollutant removal resulting in improved downstream water quality and are designated as critical habitat (within the floodplain) for Rio Grande silvery minnow.

**V. CUMULATIVE EFFECTS**

Cumulative effects are those effects of future State or private activities, not involving Federal activities, which are reasonably certain to occur within the Action Area of the Federal action subject to consultation (50 FR 402.02). Cumulative effects include the effects of future State, Tribal, local or private actions that are reasonably certain to occur within the Action Area considered in this Opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the ESA. The Service (2003a; 2010a; 2011; 2013a; 2014; 2016) and Reclamation (2015) have described cumulative effects, which are incorporated here by reference, along with the cumulative effects below, which inform the jeopardy analysis for the Proposed Action.
Based on Ellis (2015), the Service expects that cumulative human activities will continue to affect silvery minnow habitat, the quality, availability, and timing of its prey, its predator and competitor relationships, the incidence of disease, the conditions that exceed its physiological tolerances, or that alter its rates of metabolic and biochemical processes, to continue to occur either individually or in combination, in the Action Area and to affect the status of the species in the Isleta Reach. The Service considered these cumulative impacts as well as the effects of climate change and determined that cumulative effects would not be measurable at the scale of the Proposed Action. Cumulative effects will continue to reduce the quality and quantity of the silvery minnow's habitat and continue to threaten its survival and recovery.

VI. CONCLUSION

After reviewing the status of the silvery minnow, the analysis of effects of the proposed action, along with the environmental baseline, it is the Service's opinion that the NM 6 bridge Proposed Action does not jeopardize the continued existence of the silvery minnow. The majority of silvery minnows adversely affected (up to 334 per day) will mostly occur due to harassment (from mechanical activities and construction noise), with few silvery minnow mortalities expected due to the proposed action. Permanent impacts to riparian vegetation and wetlands will be offset by NMDOT replanting efforts and with NMDOT's proposed silvery minnow habitat enhancement project, with these measures in place few to no silvery minnow mortalities are expected due to this part of the proposed action (Table 1). Temporary impacts to wetlands may cause water quality issues (in the short term) but wetlands are expected to regenerate quickly after project completion with few silvery minnow mortalities expected due to this part of the proposed action (Table 1). During the proposed action, we do not anticipate that overall silvery minnow abundance index measured in the fall will drop below 0.3 silvery minnow/100m². With the proposed conservation measures from NMDOT and the offsetting measures for habitat enhancement on the east bank under the existing bridge, the Service expects the amount and type of incidental take of silvery minnows by the proposed action is unlikely to appreciably diminish its abundance in the Isleta Reach, nor for the species as a whole in the MRG.

<table>
<thead>
<tr>
<th>Type of work</th>
<th>Temporary impacts to:</th>
<th>Permanent impacts to:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Riparian vegetation</td>
<td>Wetlands</td>
</tr>
<tr>
<td>Bridge and approach construction activities</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Vegetation removal and dewatering</td>
<td>N/A</td>
<td>0.8 ha (2.1 acre)</td>
</tr>
<tr>
<td>Existing bridge deconstruction</td>
<td>N/A</td>
<td>0.6 ha (1.5 acre)</td>
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<tr>
<td>Four full piers and a pier with one pier drill shafts</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>Totals:</td>
<td></td>
<td>1.4 ha (3.6 acre)</td>
</tr>
<tr>
<td>Impact offsets: (proposed by NMDOT)</td>
<td></td>
<td>Expected to regenerate after project ends</td>
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Table 1. Temporary and permanent impacts to riparian vegetation and wetlands from New Mexico Department of Transportation’s (NMDOT) Proposed Action. Proposed offsets by NMDOT are included at the bottom of the table.
The Service estimates that 0.01 ha (0.01 acres) of piers and bridge scour will adversely affect silvery minnow critical habitat. The Service estimates that the proposed 0.10 ha (0.25 acres) of habitat enhancement will offset the losses of fine substrate and high velocities by the project impacts (Table 1). With the offsetting measures of habitat enhancement onsite, the extent of habitat loss of designated critical habitat will not affect the survival and recovery of silvery minnow. We consider that the gain of 0.10 ha (0.25 acres) of slow velocity water with fine substrate will improve the function of silvery minnow critical habitat as compared to the loss of 0.01 ha (0.01 acres) of fine substrate and high velocities associated with the piers and bridge scour.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulation pursuant to section 4(d) of the ESA 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 by the Service 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 by the Service 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 under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by FHA (or NMDOT) so that they become binding conditions of any grant or permit issued, as appropriate, for the exemption in section 7(o)(2) to apply. The FHA (or NMDOT) has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the FHA (or NMDOT) fails to assume and implement the terms and conditions or fails to require adherence to the terms and conditions of this Incidental Take Statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, FHA (or NMDOT) must report the progress of the proposed action and its impacts on to the Service (annually) as specified in this Incidental Take Statement (50 CFR §402.14(i)(3)).

Amount or Extent of Take Anticipated

The Service has developed this Incidental Take Statement based on the premise that the Proposed Action will be implemented as described along with the final design of the proposed habitat enhancement actions. Take of silvery minnows is expected in the form of harassment, harm, and mortality due to the Proposed Action, and is restricted to the action area. If actual incidental take meets or exceeds the predicted level, then FHA (and NMDOT) must reinitiate consultation.

The Service estimated that as many as 334 silvery minnows per day would be harassed, daily with up to 501,000 silvery minnows adversely affected by the proposed action for its duration.
As many as 334 silvery minnows may subsequently die in any one day due to the proposed action. If scientific evidence is provided to the Service that indicates that actual incidental take of silvery minnows (juveniles or adults) exceeds 334 individuals in any single day due to the proposed action, then the FHA (or NMDOT) must contact the Service and reinitiate formal consultation.

The Service bases the estimates of silvery minnows harassed on the best available information on a high (85th percentile) density expected to be encountered during any year during the implementation of the proposed action in the Action Area. The Service notes that this represents a best estimate of the extent of take of silvery minnows that is likely during the Proposed Action. Project specific monitoring of silvery minnows near the areas of impact associated with construction activities along or near the shoreline was not proposed. However, Reclamation has an active silvery minnow population monitoring program for the MRG and Isleta Reach, including survey sites near the Action Area (Dudley et al. 2016). Based on the summary of relevant population monitoring results (Dudley and Platania, 2009; 2010; 2011; 2012; Dudley et al. 2013; 2014; 2015; 2016), the likelihood of higher densities of silvery minnows in the action area in the months of the proposed action, should be rare. Therefore, population monitoring program results will be monitored by the Service frequently, and if the Isleta Reach silvery minnow density is greater than 11.5 silvery minnow/100m², then incidental takes could be exceeded and FHA (and NMDOT) should consult with the Service and if necessary, reinitiate formal consultation.

To help minimize incidental takes of silvery minnow, the Service will authorize biologists with a Section 10(A)(l)(a) permit and contracted by the FHA (or NMDOT) to conduct entrapment monitoring and silvery minnow rescue (from within silt fences, or any other features associated with the proposed action) for up to five years from the issuance of this Opinion. The rescue of up to 100,200 silvery minnows per year (that could potentially become stranded at any feature of the proposed action) is authorized for up to five years from the issuance of this Opinion. Any adverse effects to silvery minnow associated with the entrapment monitoring protocol (Attachment A), including those from seining and relocating silvery minnow to the main river channel are for the intended purpose of rescue activities, and those takes will be attributed to this Opinion.

**Effect of Take**

The Service has determined that this level of anticipated take is not likely to result in jeopardy to the silvery minnow. The NM 6 bridge Proposed Action may affect, is likely to adversely affect, silvery minnow by harassment, harm, and mortality. Incidental take will mainly result from harassment of minnows during construction activities, in high velocities associated with the piers, and mortality of any individuals that may become stranded in restoration features (e.g., ephemeral channels) after peak flows recede, by water quality degradation, or cumulative stress.

**Reasonable and Prudent Measures**

The following reasonable and prudent measures (RPMs) are necessary and appropriate to minimize incidental takes of silvery minnows from the proposed action:

1. Minimize takes of silvery minnows and reduce project impacts to their habitat.
2. Reduce the elevation of the east bank under the existing bridge during construction and shape the landscape to naturally drain to the river or the main channel of the river to avoid entrapment.

Minimizing the extent and duration during construction or other activities near or along the shoreline may reduce the adverse effects to silvery minnows from disturbance, noise, vibration, and water quality alterations. Constructing features to drain back into the river as waters recede may reduce the number of silvery minnows harmed as a result of stranding.

**Terms and Conditions**

Compliance with the following terms and conditions must be achieved in order to be exempt from the prohibitions of section 9 of the ESA. These terms and conditions implement the Reasonable and Prudent Measures described above. These terms and conditions are non-discretionary.

To implement RPM 1 the FHA (or NMDOT) shall:

a) To the extent practicable, minimize the area and duration of construction and other project related activities near (on the bottom of floodplain), in, or along the shoreline of the channel in the Action Area from mid-April through June, each year.

b) Ensure that conservation measures described in this Opinion are implemented, including those pertaining to equipment and operations, staging and access, water quality, noise abatement, and others BMPs.

c) Report to the Service findings of injured or dead silvery minnows, including eggs.

d) Implement the entrapment monitoring (Attachment A) and removal of stranded fish within the construction site and the east bank area under the existing bridge and subchannel, as appropriate.

e) Report the results of activities conducted within the channel and floodplain annually to the Service for as long as construction occurs in the floodplain.

To implement RPM 2 the FHA (or NMDOT) shall:

a) During construction activities onsite, reduce the elevation of the east bank under the existing bridge. Invite NMESFO staff to review and discuss the proposed habitat site.

b) Shape the landscape features to drain back into the river as waters recede to reduce the number of silvery minnows harmed as a result of stranding.

For all RPMs, FHA (or NMDOT) shall monitor the implementation of the RPMs and their associated terms and conditions, and provide a report of their status of implementation and a summary of project activities to the Service’s NMESFO annually, no later than January 30th, for any proposed action activities conducted during the previous calendar year, until the proposed project activities are complete. Report to the Service’s NMESFO the discovery of any silvery minnow mortalities associated with the proposed action. Ensure that the Service receives electronic copies of all reports and plans related to implementation of these RPMs and terms and conditions, including but not limited to, any habitat enhancement designs and observations of success. Annual summaries of activities may be abbreviated and may be provided via email or in writing. These annual reports should reference Consultation # 02ENN00-2017-F-0059 and
be sent to the email address: nmesfo@fws.gov or by mail to the U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office, 2105 Osuna Road NE, Albuquerque, New Mexico 87113.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA 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. The Service (2011b; 2012; 2014) provided conservation recommendations in previous Opinions incorporated here by reference. In addition, the following conservation recommendations are provided:

- Reduce the direction, amount, and effects of traffic noise into the Rio Grande in the area.
- Direct all lighting away from the river channel and floodplain.
- Consider using sound barriers on the newly constructed bridge for noise abatement.
- Consider the rapid deployment of non-toxic, absorbent materials during response and clean ups of traffic accidents on the bridge with complete spill and material removal.
- In the case of utility emergencies at bridge crossings, consider requirements for automatic shutoffs for all utilities that use the new bridge.
- Include descriptions of the silvery minnow in any educational materials provided on or under the new bridge over the Rio Grande.
- Discourage non-native species (e.g., pigeon) from roosting directly over Rio Grande.

REINITIATION NOTICE

This concludes formal consultation on the action described in the FHA’s and NMDOT’s NM 6 Proposed Action (Frye and Herring 2018; Smith and Herring 2018). As provided in 50 CFR § 402.16, re-initiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, such as the discovery of over 334 dead silvery minnows associated with the proposed activities, then operations causing such take must cease.
LITERATURE CITED


Duncan, G. 2018. Email containing proposed plan sheets for minnow mitigation area.


Heitmann, G. L. 2018. FHWA to USFWS cover letter initiating consultation.


U. S. Fish and Wildlife Service (Service). 2003a. Biological and conference opinions on the effects of actions associated with the programmatic biological assessment of Bureau of Reclamation’s water and river maintenance operations, Army Corps of Engineers’ flood control operation, and related non-Federal actions on the Middle Rio Grande, New


U. S. Fish and Wildlife Service (Service). 2012. Biological Opinion on the effects of the Albuquerque Metropolitan Arroyo Flood Control Authority permit application to U. S. Army Corps of Engineers (Action Number SPA-2010-00435-ABQ; Corps 2011) authorization to discharge fill material, widen, regrade, and stabilize the westernmost portion of the North Diversion Channel from its outfall with the Rio Grande to the Equipment Crossing (NMISC San Acacia Habitat Restoration Project) on endangered Rio Grande silvery minnow and endangered southwestern willow flycatcher. U. S. Fish and Wildlife Service: New Mexico Ecological Services, Albuquerque, New Mexico. USFWS Consultation No. 02ENNM00-2012-F-0005. 83 pp.


Figure 1. Project and Action Area Vicinity maps (from Frye and Herring 2018).
Figure 2. Proposed NM-6 Bridge Replacement (from Frye and Herring 2018).
Figure 3 – Map showing 0.1 hectare (0.25 acre) New Mexico Department of Transportation’s Proposed Rio Grande silvery minnow (RGSM) Habitat Enhancement Area approximate location under the existing bridge on the east bank.
Figure 4. – Mean monthly discharge (01/2010 through 11/2014 from Gage # 08331160 near Bosque, NM) at the nearest upstream stream gage to the project area (from U. S. Geological Survey National Water Information System – https://nwis.waterdata.usgs.gov/).
Figure 5 – Yearly Rio Grande silvery minnow mixture model estimates of density ($E(x)$), using October sampling-site data (1993-2015). Solid circles indicate modeled estimates and bars represent 95% confidence intervals. Dotted horizontal lines represent orders of magnitude. Gray diamonds indicated simple estimated of mean densities using the method of moments. (Dudley et al. 2015).
Attachment A: Entrapment Protocol for Silvery Minnow in Pools and Rescue
Apply to the FHWA/NMDOT NM 6 Reconstruction and Bridge Project Consultation No. 02ENNM00-2017-F-0059 valid until February 15, 2024

A copy of this Entrapment Protocol must accompany the biologists in possession of an active Federal Fish and Wildlife Permit (Section 10(A)(1)(a) permit for recovery activities), who are contracted by and working on behalf of the New Mexico Department of Transportation (NMDOT; or Federal Highway Administration), to monitor, observe, pursue, and attempt to rescue annually up to 100,200 isolated, trapped, or stranded Rio Grande Silvery Minnows (**Hybognathus amarus***) that may occur with ephemeral channels, in any areas isolated by construction activities, in areas behind silt curtains, or other construction areas in or near the channel, and any backwater features restored as part of the silvery minnow habitat mitigation activities **within the NMDOT rights-of-way at, or just below, the New Mexico Highway 6 Bridge**. A thorough visual examination and appropriate materials for netting of both ephemeral water features (and other sites associated with construction activities, as appropriate) will be conducted by the biologist, as directed by NMDOT, to look for the presence of silvery minnows. This includes pools isolated by equipment or by lack of flow of any depth where potential silvery minnow entrapment may have occurred.

1. Monitoring for silvery minnow entrapment in construction areas, or restored features may occur from July 1 through April 15 during construction, or at any time up until April 15, 2024, following spring runoff events, after large precipitation events, or after other flow events that could introduce water into an area, and result in isolated pool(s) containing silvery minnows as water recedes.

2. Monitoring at restored features or during site activities will be done using best judgment and the timing and frequency monitoring and rescue will be done in coordination with the NMDOT Project Manager and the Service’s New Mexico Ecological Services Field Office (NMESFO) staff, as appropriate.

3. Monitoring will be conducted until such time as (a) the site is dry, (b) all silvery minnows are removed from the isolated pool, or (c) flows increase such that the isolated pool becomes reconnected to the main channel.

4. If isolated pools occur at restored features that may contain silvery minnows, a permitted fisheries biologists will lead the effort to seine these pools and determine (a) the presence or absence of silvery minnows, and (b) the potential number present. Silvery minnows collected during seining of isolated pools will then be released into continuous parts of the river.
5. Should silvery minnows be observed as having died (based on lack of movement with gentle prodding) then the biologist will observe and record the species identification, standard length, reproductive condition, and health condition of silvery minnows that have perished: the pool depth, other dimensions, and any observations of water quality information will be recorded to the extent possible. Biologists will make and report any observations of silvery minnow health, such as whether fish exhibit signs of compromised health due to disease (e.g., fungus, Lernia, hemorrhagic lesions), anemia (i.e., emaciation), or physical deformity. Any dead or dying silvery minnows will be enumerated and counts will be maintained for all collections separately for each pool. A handheld global positioning system (GPS) unit with sub-meter accuracy will be used to record pool locations. Photography is encouraged. After notification to the Service’s NMESFO staff, any dead silvery minnows may be collected by the permitted biologist and preserved in 10% formalin and later transferred to a 5% buffered solution for accession to the University of New Mexico Museum of Southwestern Biology.

6. The findings of any activities conducted under this entrapment monitoring will be immediately reported to NMDOT and NMESFO, and subsequently included in the annual report for Consultation No. 02ENNM00-2017-F-0059.

7. If silvery minnow take is met or exceeded (based on Consultation No. 02ENNM00-2017-F-0059 Incidental Take Statement) in these pools or at the restored features, the Service will be contacted before continuing with any further silvery minnow monitoring activity.

8. Biologists conducting silvery minnow entrapment monitoring and rescue must possess a valid Federal Fish and Wildlife Permit and adhere to all of its terms and conditions.