Shelly Barnes, Regulatory Project Manager
U.S. Army Corps of Engineers
4101 Jefferson Plaza NE
Albuquerque, NM 87111

Dear Ms. Barnes:

This document transmits the U.S. Fish and Wildlife Service’s (Service) final biological opinion (Opinion) on effects of the U.S. Department of the Army, Corps of Engineers, Albuquerque District (Corps) proposed action of permitting construction of the proposed bank stabilization and erosion control project, on Secundio and Theresa Baca’s (landowners) at 814 Sandoval Lane, Bernalillo in Sandoval County, New Mexico (i.e., Proposed Action on Baca Bank Stabilization Project), NM (Figure 1). The Corps is evaluating the Baca’s application to address the bank erosion occurring on the Baca’s private property. The bank stabilization will be conducted from mid-February to mid-April with various restrictions of activity due to species protection or safety. Dredging, fill, and construction activity is also proposed to occur in and near the Rio Grande (river) under a nationwide permit authorized by the Corps. The focus of this consultation is the bank stabilization and associated construction activities. The Corps as the lead federal agency, has requested formal consultation with the Service on the Proposed Action.

This Opinion addresses the effects of the Baca Bank Stabilization Project on the endangered Rio Grande silvery minnow (*Hybognathus amarus*) (silvery minnow), its designated critical habitat, the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) (flycatcher), its designated critical habitat, the threatened yellow-billed cuckoo (*Coccyzus americanus*) (cuckoo), and its proposed critical habitat.

This Opinion is based on information submitted in the December 16, 2016, Informal Consultation SPA-2016-224-ABQ packet (Corps 2016), calls, and emails between Corps and the Service, supplemental information provided electronically, and other sources of information.
available to the Service. The administrative record for Consultation No. 02ENNM00-2017-F-0279 is on file at the Service's New Mexico Ecological Services Field Office in Albuquerque, New Mexico.

The Service concurs with Corps' findings that the Proposed Action "may affect, but is not likely to adversely affect" flycatchers and cuckoos. As documented in Corps document (Corps 2016), the timing and location of project activities are unlikely to disturb foraging or nesting behavior of flycatchers or cuckoos and therefore, are discountable. No critical habitat is designated for the flycatcher in the project area and therefore, none is affected by the Proposed Action. Critical habitat is designated for the cuckoo in the project area but the Proposed Action does not include vegetation removal so this would not affect cuckoo habitat.

The Service is unable to concur with Corps findings that the Baca Bank Stabilization Project "may affect, is not likely to adversely affect" silvery minnow or silvery minnow designated critical habitat because effects of the Proposed Action are not wholly beneficial, discountable, or insignificant. As described in this Opinion, direct and indirect effects of the Proposed Action to silvery minnow and silvery minnow habitat are likely to adversely affect silvery minnow and their designated critical habitat.

In future correspondence on this project, please refer to Consultation No. 02ENNM00-2017-0279. If you have any questions or would like to discuss any part of this Opinion, please contact David Campbell at (505) 761-4745 or Clinton Smith of my staff at (505) 761-4743.

Sincerely,

Susan Millsap
Field Office Supervisor

cc: (electronic copies)
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Administrative Record Consultation Number 02ENNM00-2017-0279 (clinton_smith@fws.gov)
BIOLICAL OPINION

I. DESCRIPTION OF THE PROPOSED ACTION

Private landowners, Secundio and Theresa Baca, of 814 Sandoval Lane, Bernalillo, NM, own property along the west bank of the Rio Grande downstream (south) of the US Highway 550 Bridge, in Sandoval County, New Mexico. Approximately 250 linear feet of their 0.85 hectares (2.11 acre) property along the bank is eroding at an accelerated rate due to the direction of flow of the river approaching this property at a perpendicular angle (Figure 2). In order to arrest this erosion and prevent further loss of land, to preserve remaining standing cottonwood trees, and to protect the infrastructure on their property, they propose to install four rock vane/bank barbs or bendway weirs along 76.2 meters (250 linear feet) of their property along the Rio Grande. The proposed project will begin at the north end of the applicant’s property line with one structure placed at this location at an angle of 50° tangent to the bank. The southernmost structure will be constructed as close as possible to the existing rock rip rap (placed on this property by the adjacent landowner in 2015) and extend from the bank to the northeast at a 30° angle. The two remaining structures will be placed approximately equal distant between the two outer structures at a 30° angle. All four structures will be constructed with a final top elevation of one foot above the flood plain and sloping downward at a 10 to 1 ratio. The structures will be constructed of D50 16 inch native rock and tree trunks.

The project is proposed to begin construction during the winter months of 2016/2017 in order to conduct activities during a period of low-flow and to prepare for the 2017 spring run-off. The landowners propose to use a contractor to construct the four structures with the use of a crane, excavator and skid steer over a two-week period. A cofferdam will be utilized if it becomes necessary to allow access of equipment to the river channel.

The property owner immediately adjacent to the southern property line installed rock rip rap in 2015 on his property as an emergency temporary measure to protect the residential structure from damage due to the eroding bank. The Proposed Action is planned to tie in with this existing rip rap and deflect the thalweg away from the west bank of the Rio Grande to protect these two properties.

The landowners have requested a Department of the Army Permit to comply with Clean Water Act 404 provisions to construct this project.

Action Area

The action area is just south of the US 550 Rio Grande (George Renldi) Bridge, located at 814 Sandoval Lane, Bernalillo, NM (approximately 35.32105W, 106.55936N). The action area is located immediately adjacent to the bank of the river extending from the northern edge of the landowners’ property down to the southern edge of the same property (approximately 76.2 meters [250 linear feet]) (Figure 1). This would include the floodway along the river. The term floodway refers to the river and the area next to the river (shoreline or bank) that is subject to erosion. Access to the project area would occur from the driveway and along the north or south edge of the lot to the river bank.
Conservation Measures

The Service proposes the following conservation measures to avoid, minimize, and mitigate potential impacts:

Timing of the Proposed Action
- Corps shall require the landowners and contractors to avoid impacts to birds protected by the Migratory Bird Treaty Act (16 U.S.C. 703) by conducting construction activities outside of the normal breeding and nesting season (April 15 to August 15). If construction activities fall between April 15 to August 15, then migratory bird surveys would be conducted immediately prior to the work to determine if any breeding birds are present. If birds are detected, landowners and contractors would coordinate with the Corps and Corps will coordinate with the Service to determine appropriate next steps.
- Limit in-channel construction to those months during low-flow conditions; which on average, occur from mid-July through March (to mid-April) for this reach to reduce the likelihood of surface water contact with equipment as well as surface water quality and sediment impacts. If construction activities are necessary between March to July, then landowners and contractors would coordinate with the Corps and Corps will coordinate with the Service to determine appropriate next steps.

Water Quality
- Corps shall require the landowners and contractors to obtain all applicable permits prior to implementation of the project, to include Clean Water Act (CWA) permits. Landowners and contractors will comply with all requirements of the CWA and other permits associated with the project, including required reporting to the appropriate authorities as needed.

Equipment
- The contractor will provide a spill prevention and containment plan; implement the plan, employ workers trained in spill containment, and notify the designated Corps immediately if a spill occurs. The Corps will notify the Service.
- Machinery will be washed prior to use at the project area to prevent spreading weeds or disease from other locations.
- The distance for equipment storage from flowing water will be maximized. Refueling and maintenance will occur in designated areas outside of the Rio Grande floodplain and all heavy equipment will be inspected daily for leaks. Leaking equipment will not be used in or near any watercourse.
- If an excavator is required to remove soil from below the water line, the contractor will be required to tilt the bucket (after being raised above water levels) to drain water prior to placing earth onto land.

Other Measures
- Riprap to be placed in the water will be reasonably clean to the extent possible. If there are large clumps of soil bigger than 0.3 meters (1 foot) within the riprap, those clumps will be set aside during the loading or placing operations.
II. STATUS OF THE SPECIES

*Rio Grande silvery minnow*

The Proposed Action may adversely affect endangered silvery minnow (Service 1994) in the Action Area. A description of the silvery minnow, its status, proposed critical habitat and primary constituent elements are provided below and informs the effects analysis.

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-km (174-mi) stretch of river that runs from Cochiti Dam to the headwaters of Elephant Butte Reservoir (Bestgen and Platania 1991; Dudley and Platania 2002). This includes a small portion of the lower Jemez River, a tributary to the Rio Grande north of Albuquerque (Service 2010a). Its current habitat is limited to about seven percent of its former range, and is split by three dams into four reaches. Additionally there is an introduced nonessential, experimental population 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. 2011). 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 °C (64 and 75 °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 egg and larvae downstream transportation was, historically, beneficial to silvery minnow populations because it allowed silvery minnow to recolonize downstream reaches impacted during periods of natural drought (Dudley and Platania 1997). 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). The preference for a narrower range of physical habitat conditions by silvery minnow early life stages means that individuals are congregated into a smaller subset of areas within the river. These conditions most commonly occur in backwaters and secondary channel pools that are not directly associated with the main channel. Main channel habitats that have shallow and slow-velocity water are along the shoreline in areas where stream edges are not eroded (Dudley and Platania 2007).

Critical habitat for the silvery minnow was designated in 2003 (Service 2003a). Designated critical habitat extends 252 km (157 mi) from the Cochiti Dam downstream to RM 62.1, 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 meters (300 feet) of riparian zone adjacent to each side of the bankfull stage of the river channel. The Pueblo lands of Santo Domingo, Santa Ana, Sandia, and Isleta found within this area were excluded from this designation (Service 2003a).

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 degree Celsius (°C) [35 degrees Fahrenheit (°F)] and less than 30 °C (85 °F) and reduce degraded conditions (e.g., decreased dissolved oxygen, increased pH).

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 environmental baseline defines the effects of these activities in the Action Area on the current status of the species and its habitat to provide a platform to assess the effects of the action now under consultation. The Service (2003a,b, 2010a,b; 2011a,b; 2012; 2013a,b,c; 2014; 2015; 2016), the Corps (Corps 2007, 2012a,b,c)), 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), and Reclamation (Smith and Massong 2004; USBR 2003; Massong 2005; Varyu 2013; Makar 2015; Reclamation 2015; McMillan et al. 2016) have described the environmental baseline, which encompasses the Action Area, and these are incorporated here by
Generally, as a result of river management activities over the past 50 years, the Rio Grande in the Angostura 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,b, 2013; Shah-Fairbank et al. 2011; Service 2013b).

The river channel within the project area is highly dynamic, changing dramatically over short periods. Observations from spring 2015 extending into early spring 2016 suggest that the channel flowing under the bridge just north of the project area (Figure 3) may be downcutting and deepening. As a result of this process, the flow of the river accelerates as it approaches the project area bank at a perpendicular angle. This is causing bank erosion and if left unchecked will compromise the landowners home’s foundation resulting in the home collapsing into the river.

Status of silvery minnow in Angostura Reach and Action Area

Life stages of silvery minnow currently inhabit the Angostura Reach on various days, seasonally. Standard surveys of silvery minnows are routinely conducted at five discrete locations within the Angostura 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 and decreases) in the overall (MRG) population densities (an index of abundance for the silvery minnow population; Figure 4). 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 et al. (2011, 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 Angostura 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 in Table 1 the available data on silvery minnow densities in the Angostura 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).

For the purposes of this Biological 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 RGSM per 100 square meters (RGSM/100m²)) from the last nine years of monitoring efforts in the Angostura Reach (Table 1). That is, we used a density of 5.7 RGSM/100m² as representative of silvery minnow abundance within the Action Area (Table 1). This estimated average density of 5.7 RGSM/100m² will be used to conservatively represent the status of the species for the duration of the Proposed Action, despite population fluctuations. 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.

**Status of silvery minnow critical habitat in the Angostura Reach**

With the exception of the lands of the Pueblos of Santo Domingo, Santa Ana, Sandia, and Isleta (Service 2003a), the floodplain and river channel between the Angostura Diversion Dam to the Isleta 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 m (300 ft) of riparian zone adjacent to each side of the bank full stage of the MRG. The Service (Service 2003a) 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). 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 trans-basin diversions of water (Service 2016). 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). 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, 2016).
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 38.1 meters (125 feet) long by 45.7 meters (150 feet) wide or 18,750 ft$^2$ (0.16 ha, 0.4 acres or 1,742 m$^2$) will be directly harassed by human activities, heavy equipment operations, and any ancillary activities described by Corps (2016). Using an average (85th percentile) density of 5.7 silvery minnows per 100 m$^2$, then the number of silvery minnows potentially harassed or harmed within any one day of activities is approximately 99 per day. Activities that take place over two months (30 days x 2 months x 99 silvery minnows = 5,940) could potentially affect up to 5,940 silvery minnows with some affected on multiple days and times.

**Mechanical Activities and Water Quality Impacts**

Increased human and heavy equipment activity and noise may cause wildlife 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 could be impacted if occupying the river within or immediately downstream of the construction activities.

If equipment were to make direct contact with occupied river substrates, an unexpected release of petrochemicals, large volumes of slurry, or sediment were to occur during the activity, and then individual silvery minnows present in downstream waters could be impacted. If an unexpected release of petrochemicals or sediment were to occur during the activity, individuals 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.

**Bendway weir construction**

Under current design, the project would construct four bendway weirs along the river bank. The overall width of the work is 38.1 meters (125 feet). A minor but permanent impact to occupied critical habitat 0.16 ha (0.4 acres) would result from the installation of the new bendway weirs resulting in a change of substrate size and distribution from small, fine sediment, and gravel to cobble and rip rap.

The weir installation temporary access fill activity would occur within occupied designated critical habitat. Individual silvery minnows could be harassed (flee from and avoidance of the area) and be harmed during temporary access construction (placement of bendway weirs, rip rap and soils within the low-flow channel) and removal; exposed to local increases in sediment (physiological stress, alteration of normal respiration); and via the operation of equipment in the channel (noise, vibration).

Diversion of flows from the construction sites could alter silvery minnow access to shelter and food sources and may entrap individuals. Diversion of flows, dewatering, weir construction, and need for equipment access would result in portions of the river being unsuitable to support established aquatic life for the two month time period. Diversion of flows temporarily affects silvery minnow critical habitat by reducing the distribution and diversity of aquatic habitats.

**Beneficial Effects of the Proposed Action**

The Proposed Action is anticipated to have beneficial effects on silvery minnows in the long-term by redirecting and decreasing the flow of water coming through this part of the river and potentially creating feeding and refugia silvery minnow habitat. The water flow at this site without the Proposed Action is expected to remain the same or increase.

**Summary of Effects to Silvery Minnow and Critical Habitat**

The Service has defined take by harassment as an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. The Service has also defined take by harm as an act which actually kills or injures wildlife (see 50 CFR 17.3). Harassment and mortality of silvery minnows may occur due to bendway weir construction. Construction of the bendway weirs are expected to result in adverse effects up to 99 silvery minnow per day and 0.16 ha (0.4 acres) of critical habitat for the duration of the Proposed Action.

**V. CUMULATIVE EFFECTS**

Cumulative effects include the effects of future state, tribal, local or private actions, which are reasonably certain to occur within the Action Area of the Federal action subject to consultation
(see 50 FR 402.02). 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 (2003b, 2010b, 2011a,b, 2013a,b,c, 2014, 2016) and Reclamation (2015) have described cumulative effects, which are incorporated here by reference, along with a summary of 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 Angostura 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 (about two months). These cumulative effects will continue to reduce the quality and quantity of the silvery minnow’s habitat and continue to threaten its survival and recovery.

VII. 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 proposed Baca Bank Stabilization project does not jeopardize the continued existence of the silvery minnow. The Service expects the amount and type of take of silvery minnows by the Proposed Action is unlikely to appreciably diminish its abundance in the Angostura Reach, nor for the species as a whole in the MRG. Additionally up to 0.16 ha (0.4 acres) of designated critical habitat will be adversely affected by the Proposed Action. The extent of habitat loss of designated critical habitat will not affect the survival and recovery of silvery minnow.

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA 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 (see 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 (see 50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.
The measures described below are non-discretionary, and must become binding conditions of any grant or permit issued by Corps to the applicant, as appropriate, for the exemption in section 7(o)(2) to apply. The Corps has a continuing duty to regulate the activity covered by this Incidental Take Statement. If the Corps 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, Corps must report the progress of the Proposed Action and its impacts on the species to the Service as specified in this Incidental Take Statement (see 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 Baca Bank Stabilization project action will be implemented as proposed in Corps 2016 letter. Take of silvery minnows is expected in the form of harassment and mortality due to the Proposed Action. If actual incidental take meets or exceeds the predicted level, Corps and the landowners must reinitiate consultation.

**Effect of Take**

The Service has developed this Incidental Take Statement based on the premise that the Proposed Action will be implemented as described. The Service has determined that this level of anticipated take is not likely to result in jeopardy to the silvery minnow. The Baca Bank Stabilization project may affect, is likely to adversely affect, silvery minnow by harassment and mortality. Incidental take will result from harassment of minnow during construction activities.

The Service estimated that as many as 99 silvery minnows per day would be harassed and up to 5,940 silvery minnows may be harassed and killed during the total duration of the Proposed Action. If scientific evidence is provided to the Service that indicates that actual incidental take of harassed or killed silvery minnows exceeds the above amounts for the duration of the Proposed Action, then the Corps and the landowners 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 Angostura Reach, including survey sites near the Action Area (Dudley et al. 2016). Based on the summary of relevant population monitoring results (Dudley et al. 2009, 2010, 2011, 2012, 2013, 2014, 2016; and see Table 1), the likelihood of higher densities of silvery minnows should be quite rare. Therefore, population monitoring program results will be monitored by the Service frequently, and if the Angostura Reach silvery minnow density is equal to or greater than 15.7 fish/100m², then incidental take may be exceeded and consultation must be reinitiated.
Reasonable and Prudent Measures

The following reasonable and prudent measures are necessary and appropriate to minimize incidental take of silvery minnows from the Proposed Action:

1. Corps shall condition its permit (SPA-2016-00224) to require the applicant (landowners) to minimize take of silvery minnows and reduce impact to their habitat.

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.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, Corps shall require the landowners to comply with the following terms and conditions. These terms and conditions implement the RPMs described above and outline required reporting and monitoring requirements. These terms and conditions are non-discretionary. The applicant (landowner) shall implement these terms and conditions and they will be included by reference in the Corps permit.

To implement RPM 1:

a. To the extent practicable, minimize the area and duration of construction activities near, in, or along the shoreline of the MRG in the Action Area.

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

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

For all RPMs, Corps shall require the landowners to monitor the implementation of the RPMs and their associated terms and conditions, and provide a report of their status of implementation to the Service’s New Mexico Ecological Services Field Office upon the completion of the project. Report to the Service’s New Mexico Ecological Services Field Office 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, species monitoring or survey results. This report should reference Consultation # 02ENNM00-2017-F-0279 and be sent to the email address nmesfo@fws.gov or by mail to the 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.

- Follow BMPs to reduce the annual risks of catastrophic hazardous material or petroleum spills.

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

**Reinitiation Notice**

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


U.S. Fish and Wildlife Service (Service). 2010b. Biological Opinion on the Effects of the Middle Rio Grande Isleta Reach Phase II Riverine Habitat Restoration Project. U.S. Fish and Wildlife Service Consultation No. 02ENNM00-2010-F-0060, New Mexico Ecological Services, Albuquerque, New Mexico. 51 pp. (Spoils placed on bankline for river dilution)

U.S. Fish and Wildlife Service (Service). 2011a. Biological Opinion on the Effects of the Middle Rio Grande Bosque Restoration Project, Bernalillo and Sandoval Counties, New Mexico. U.S. Fish and Wildlife Service Consultation No. 02ENNM00-2010-F-0077, New Mexico Ecological Services, Albuquerque, New Mexico. 62 pp. (Spoils placed on bankline for river dilution or terraced into the bosque/floodway)

U.S. Fish and Wildlife Service (Service). 2011b. Biological opinion on U.S. Environmental Protection Agency’s action authorizing the discharge of pollutants in stormwater and certain nonstormwater discharges from the Large Municipal Stormwater Sewer Systems
(MS4) in the Albuquerque urbanized area in Bernalillo County, New Mexico, USFWS Consultation No. 02ENNM00-2011-F-0024-R001, Albuquerque, New Mexico.

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. USFWS Consultation No. 02ENNM00-2012-F-0005, Albuquerque, New Mexico.


U.S. Fish and Wildlife Service (Service). 2013b. Biological Opinion on the Effects of the Rio Rancho Open Space Habitat Restoration Project within the Albuquerque Reach of the Middle Rio Grande. U.S. Fish and Wildlife Service Consultation No. 02ENNM00-2013-F-0029, New Mexico Ecological Services, Albuquerque, New Mexico 63 pp. (Spoils sold, hauled away, or placed at elevation above 6,000 cfs overbank flood)

U.S. Fish and Wildlife Service (Service). 2013c. Biological Opinion on the Effects of the State Trust Land Bosque Riparian Restoration and Associated Swale Construction Project. U.S. Fish and Wildlife Service Consultation No. 02ENNM00-2014-F-0010, New Mexico Ecological Services, Albuquerque, New Mexico 57 pp. (Spoils placed on Refuge, and placed adjacent to levee road on the river side)


Figure 1. Map showing property boundary and approximate location of the Baca Bank Stabilization Project Action Area (Source: Corps 2016, map created by the Service).
Figure 2. Photographs from 8/25/2016 site visit. Photos A and B are views facing north of the eroded bank standing on the south end of the action area. Photo C is view facing south of the eroded bank showing the existing rock rip rap on the adjacent property (Source Corps 2016).
Figure 3. Photograph from 8/25/2016 site visit. Photo D shows Hwy 550 bridge and east river bank. Photo D was taken while standing on the bank at the south end of the action area (Source Corps 2016).
Figure 4. Yearly 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).
Table 1. Estimated monthly densities of silvery minnows (RGSM per 100 m²) during standard surveys in the Angostura Reach, with average and 85th percentile RGSM densities, across all 9 survey sites, for the period between April 2009 and October 2016 (excluding non-construction months of April through July) [“na” – data unavailable; “ASIR” – American Southwest Ichthyological Researchers (Dudley et al. 2016); “NMFWCO” – New Mexico Fish and Wildlife Conservation Office].

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