



# United States Department of the Interior



## FISH AND WILDLIFE SERVICE

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July 31, 2018

Consultation Number 02ENNM00-2018-F-0260

Dorothy W. Cook, Senior Environmental Specialist/Team Lead  
Federal Emergency Management Agency, Region 6  
Department of Homeland Security  
800 N. Loop 288  
Denton, Texas 76209

Dear Dorothy Cook:

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 Department of Homeland Security, Federal Emergency Management Agency's (FEMA) Biological Assessment (BA) was dated January 12, 2018. At issue are impacts that may result from Socorro County's proposed Wildfire Hazard Mitigation Project located in Socorro County, New Mexico (Proposed Action). The end date for this Proposed Action is estimated to be the end of the Fall in 2019. You determined the Proposed Action "may affect and is likely to adversely affect" the Yellow-billed Cuckoo (*Coccyzus americanus*; cuckoo) and proposed 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).

We concur with the determination of "may affect, not likely to adversely affect" for the flycatcher and its designated critical habitat based on information provided by the BA as well as the following understanding of your project:

- Treatment areas are outside of 2017 occupied flycatcher territories;
- Though flycatcher designated critical habitat falls within the action area, 62 percent (16 out of 26) of the treatment areas lack the Physical and Biological Features (PBF). However, for treatment areas that contain the PBF, the canopy cover will remain at or above 50% so that the PBF will remain post treatment. Currently, there are 45 hectare

(112 acres) of suitable critical habitat within the treatment areas based on the latest vegetation surveys and ArcGIS analysis;

- Flycatcher designated critical habitat to be treated will ultimately be replaced with higher quality vegetation that is anticipated to benefit the species;
- Treatment measures identified within the Proposed Action will also reduce fire risk which will protect adjacent critical habitat.

Your BA also addressed the 13 additional species and their critical habitat where “no effect” determinations were made. The Endangered Species Act does not require Federal Agencies to consult on projects determined to have “no effect” on listed species or designated critical habitat. However, we will instead commend the conservation measures proposed for the species by FEMA.

The enclosed biological opinion (BO) for the cuckoo is based on information provided in your January 12, 2018, BA, the meeting held in Albuquerque, NM on February 22, 2018, about the Proposed Action, the conference call on May 3, 2018, email exchanges, and other sources of information. Literature cited in this BO is not a complete bibliography of all literature available on cuckoos, their habitat, or on potential effects to the species considered in this BO. A complete administrative record of this consultation is on file at the NMESFO.

The Service appreciates FEMA’s efforts to identify and minimize effects to listed species from this Proposed Action. For further information, please contact Vicky Ryan at 505-761-4738 or Clinton Smith at 505-761-4743. Please refer to the Consultation Number 02ENNM00-2018-F-0260, in future correspondence concerning this project.

Sincerely,



Susan S. Millsap  
Field Supervisor

cc:

Manager, Socorro County, Socorro, NM (electronic copy)

Grants Administrator, Socorro County, Socorro, NM (electronic copy)

Project Manager, FEMA Wildfire Mitigation Projects, Socorro County, Socorro, NM (electronic copy)

Director, NM Department of Game and Fish, Santa Fe, NM (electronic copy)

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District Forester, New Mexico State Forestry, Socorro, NM (electronic copy)

Area Manager, Bureau of Reclamation, Albuquerque Area Office, Albuquerque, New Mexico (electronic copy)

## BIOLOGICAL OPINION

### DESCRIPTION OF THE PROPOSED ACTION

#### Action Area

We consider areas within 1 kilometer (km; 1,000 feet) of the proposed treatment locations to be the Action Area. Specifically, this would be located from north of the village of Pueblitos, New Mexico, south to the village of San Pedro, New Mexico, a total of 29 kilometers (18 miles; Figure 1). Numerous small towns and villages and isolated homes occur along the Rio Grande in the Action Area, with a network of privately and publicly owned lands in central Socorro County. The proposed project is on private and state lands within the floodplain of the Rio Grande that are adjacent to homes and commercial infrastructure.

#### Overview of Proposed Action

The proposed action would reduce the wildfire hazard along the Action Area riparian forest and residential areas by removing surface fuels, burning or mulching the treated fuels, and following initial treatment, spot spraying to assure effective non-native fuels control. This work would be conducted in two zones based on residential defensible space (DS) location and hazardous fuels reduction (HFR) forest interior. This follows the Socorro County Hazard Mitigation Plan. The proposed Treatment Areas within the Action Area will be approximately 547 hectares (ha; 1351 acres) (Figure 1). A total of 25 parcels are located along the Rio Grande in central Socorro County. Parcels range from 2 to 142 ha (4 to 352 acres) in size and are located in discontinuous areas adjacent to county roads and existing developments. One treatment area (Treatment Area #2) was removed from the project due to landownership issues. A total of 547 ha (1351 acres) will be treated under this project (Dello Russo 2017).

In the case of DS work, it is envisioned that removal of flammable materials, including native and non-native vegetation, would be undertaken in proximity to a residential or nonresidential structure. Three concentric zones would be created around each structure. In zone 1: up to 10 meters (m; 0 to 30 feet from the structure), all combustible material would be eliminated if considered a fire risk. In zone 2: 10 to 30 m (30 to 100 feet from the structure), all combustible materials if considered a fire risk would be eliminated with the exception of individual and well-spaced clumps of trees and shrubs or a few islands of vegetation that are surrounded by areas with noncombustible materials. In zone 3: greater than 30 to 45 m (more than 100 to a maximum of 150 feet from the structure) vegetation would be thinned and pruned horizontally and vertically in a more limited manner than zone 2 to improve the health of the wildlands and help slow an approaching wildfire. Hand crews with chain saws and a mulcher/masticator will be used for DS work. In most cases, DS work is combined with HFR projects to assure protection for both structures and firefighting personnel.

The HFR Zone extends to larger blocks of Rio Grande riparian forest adjacent to DS or within the interior of the riparian forest belt along the river. Removal of Standing Biomass: An estimated 50 to 70% of standing non-native vegetation will be removed from HFR areas. This vegetation will include tamarisk (also referred to as “saltcedar”; *Tamarisk* sp.), Russian olive (*Elaeagnus angustifolia*), Siberian elm (*Ulmus pumila*), Tree of Heaven (*Ailanthus altissima*),

and 70% of standing dead or dead and down cottonwood (*Populus deltoids*) and willow (*Salix* spp.). With trees greater than 15 centimeters (cm; 6 inches) in diameter, the above ground biomass will be removed using an excavator with a hydraulic thumb attachment to minimize ground disturbance in dense vegetation with mature trees. This type of machinery has been shown to limit disturbance to grasses and forbs when access to work area is staged to: 1) limit tracking over sensitive areas, 2) limit access routes to areas to be treated, and 3) limit use of this machinery to larger, denser stands where limited native and preferred plants are present. Other equipment for these dense sites will include a front end loader (using tires, not tracks) to stack the biomass removed. Hand crews with chain saws and a mulcher/masticator will also be used on some of the HFR sites.

Once the biomass is stacked into piles, debris will be treated in one of three ways: 1) small piles (no greater than 3 m x 3 m; [10 feet by 10 feet] at base) will be burned in place following prescription and under the supervision and guidance of fire personnel from Socorro County and NM State Forestry. A minimum distance of 300 m (984 feet) from the center of the river will be used as a boundary for any pile burning to avoid impacts to Rio Grande silvery minnow habitat during high flows. There are licensed contractors who are now completing this prescription for private landowners with current fire qualifications, training and liability insurance. 2) Small piles will be chipped utilizing Socorro County's chipper. Staff and contractors trained to complete this work safely will be those authorized when this technique is used. 3) A masticator attached to a front-end loader will be used to masticate small piles to lessen fire danger. The mulched or masticated material will be spread to prescription (less than 5 cm [2 inches] thick on the ground) across the treatment area. Area residents have been interested in these fuels for personal fire wood use, and wood harvesting is an option with landowner permit or permission if it can be allowed in a safe and efficient manner.

When vegetation is less than 15 cm (6 inches) in diameter, or in sensitive sites where excavator use is not recommended, hand clearing with chain saw and herbicide application is a preferred treatment. This applies to the same species of vegetation mentioned in Step 1. A trained hand crew with chain saws removes the woody vegetation to the base. After biomass cutting, a trained and licensed applicator applies recommended herbicide to the cut stump. This treatment has been shown to be effective and utilizes the minimal amount of chemical to a very specific area. Applicators are licensed in the state of New Mexico, and partner organization, the Socorro Soil and Water Conservation District will review chemical application plans to assure compliance with state requirements. Secondary, follow up chemical treatment of resprouts may be necessary during the following growing season. This is accomplished through a technique called basal bark application. This treatment also minimizes the amount of chemical applied and targets the base of resprouts only, limiting aerial dispersal of herbicide. Starting with the next growing season, one spot treatment using approved herbicide will be completed on unwanted vegetation resprouts. These will be accomplished by cooperating agencies or by individual landowners with direct supervision from the agencies.

In all zones, non-native trees would be removed utilizing the treatment specifications outlined in (Dello Russo 2017).

**Conservation Measures:**

- No work will be performed within the river.
- All necessary permits for access points, staging areas, and study sites will be acquired prior to commencing construction activities. Access to treatment and mitigation areas will be via internal (unimproved) roadways or by designated access routes when established roads are not present. Pre-authorized access from private property owners will be obtained for workers to access the treatment areas on foot and to bring equipment to the treatment areas. Access routes will be designated on Action Area (or may be referred to as “Project Area” by FEMA) maps and flagged on site prior to work start.
- Coordination with work crews will occur prior to the start of work and throughout project implementation. This will include preconstruction coordination meetings with work crews to go over the project implementation plans, including avoidance and minimization measures intended to protect species. A Project Manager will be provided to oversee implementation of the project and ensure compliance with the avoidance and minimization measures. Two project inspectors will be assigned to each treatment area to assure continual communication with contractors during work.
- Best management practices (BMPs) will be implemented to prevent erosion and sedimentation to nearby or adjacent waters. These will include equipment storage and staging practices to minimize erosion and sedimentation, and avoiding soil or water contamination. Equipment will be inspected for spillage. Equipment will also be cleaned prior to original arrival at treatment site, and when moving from treatment area to treatment area to assure no transport of invasive vegetation.
- Staging areas will be located at least 30 m (100 feet) away from any surface or shallow ground water source or live fuels. Staging sites will be flagged appropriately and the project proponents will develop written protocol to address spills or contamination of soil. This protocol will go in to each contractual agreement for on-the-ground work.
- In general, equipment operation will take place in previously cleared areas or where vegetation is particularly sparse, and all efforts would be made to minimize damage to native riparian vegetation. No native vegetation will be removed in HFR treatment areas. Native vegetation removal is likely in DS treatment areas but none of these areas have flycatcher or cuckoo suitable habitat.
- Fuel reduction activities will take place outside of nesting season (from September 1 through April 15). The exception to this will be limited work when hand crews work from April 15 to April 30. During this time, crews will work only in areas that are greater than 100 meters (300 feet) from the center of river, where past wildfires has limited vegetation, or adjacent to flycatcher and cuckoo territory buffers.
- A 150 m (500 feet) “no treatment zone” buffer will be implemented around occupied flycatchers and cuckoos territories. The buffer area will be flagged/taped prior to the commencement of work and flag/tape must be promptly removed once work is complete.

Contractors will be supervised when work is being implemented within 30 m (100 feet) of any buffer to assure contractors do not enter into 150 m (500 feet) “no treatment zone” buffers. When not within this distance, staff will provide supervision as needed.

- Herbicide use will be specified in treatment plans for use during implementation and maintenance of DS and HFR areas. All application requirements for safety and environmental control will be followed. Only approved herbicides at recommended concentrations will be utilized and only licensed applicators will accomplish this work. Applicators will be licensed in the state of New Mexico, and the Socorro Soil and Water Conservation District will review chemical application plans to assure compliance with state requirements.
- Slash piles of downed vegetation will be located at least 300 meters (900 feet) from the center of the river channel.
- Native plant restoration focus will include: 1) seeding in areas where non-native plants are removed in open forest or grassland habitats to provide forage for cuckoos and 2) native understory planting in areas where non-native plants are removed under gallery forest cottonwood trees. Where possible, cottonwoods will be established to provide structural diversity to planting patches.
- Prescriptions for planting native vegetation will be developed following site hazardous fuels control. Best management practices included in these prescriptions include: Conducting soil surveys to determine areas suitable for cottonwood or willow pole plantings, planting poles from December through March 15<sup>th</sup> (if poles show any signs of bud elongation, they should not be planted), planting poles in random manner, drilling/digging holes to a depth of at least 1 foot below water table, filling holes and packing soil so that there are not air pockets, drilling shrub holes to moist soil and back filling so shrub root crown is at soil surface, planting shrubs in groups of 30 with random spacing (determined by shrub growth pattern), watering shrubs within 48 to 72 hours after planting and following up with subsequent watering (two weeks later if no rain events and throughout the first two growing seasons as needed), and planting grasses and forbs from seed or small containers near planted shrubs (to help facilitate with shrub watering schedule).

## **STATUS OF THE SPECIES**

In 2014, the cuckoo was listed as threatened (Service 2014a) and critical habitat was proposed (Service 2014b). Currently, there is no recovery plan for the cuckoo. The western population of cuckoo is considered a “distinct population segment” (DPS) as opposed to a subspecies (Service 2014a). The cuckoo is a neotropical migrant bird that winters in South America and breeds in North America (Service 2014a). The cuckoo is typically a secretive and hard-to-detect bird with a distinct vocalization. In the Southwest, the cuckoo usually occurs in association with large areas of mature riparian cottonwood-willow woodlands and dense mesquite (*Prosopis* spp.) associations (Service 2014a). This DPS is historically known from 12 states including: Washington, Oregon, California, Idaho, Nevada, Utah, Arizona, and parts of Montana, Wyoming, Colorado, New Mexico, and Texas (Service 2014a). Northwestern Mexico and

Arizona are believed to have the largest populations of cuckoos, range wide (Service 2014a). New Mexico also contains important breeding habitat for cuckoos with approximately 15 percent of the estimated population found within the state.

Cuckoos generally arrive at their breeding grounds in mid-June with nesting starting between late June and late July. Nest clutch size is typically between two and four eggs (Halterman et al. 2016). Nesting may continue into September, but along the Rio Grande, nesting activity is typically concluded by mid to late August (Sechrist et al. 2009, 2012; Carstensen et al. 2015; Halterman et al. 2016). Both adults will tend to the nest, eggs, and young. Nest heights range from 1.3 to 13 m (4 to 43 feet) and the nesting cycle is extremely rapid, taking 17 days from egg laying to chicks fledging (Carstensen et al. 2015; Halterman et al. 2016). Cuckoos typically have one brood per year (Ehrlich et al. 1988); however, in circumstances where an abundance of prey is available; cuckoos can have up to three broods (Halterman et al. 2016). Fledglings are dependent on the adults for up to four weeks, and have shorter tails and paler coloration. Little is known about cuckoo survivorship or nesting success, but telemetry and banding evidence from the lower Colorado River suggests they could live at least three years (Laymon 1998).

Cuckoo nest site fidelity information is limited. Where banding studies have taken place, returning cuckoos one or more years after initial capture were typically recaptured within 24 m (80 feet) to 80 kilometers (50 miles) from their original banding location (McNeil et al. 2013, Halterman 2009, Halterman et al. 2015). Breeding pairs of banded cuckoos along the Lower Colorado River were found occupying the same territory for up to three years (Laymon 1998, Halterman et al. 2015).

Cuckoos now breed in small isolated populations. These populations are increasingly at risk to further declines as a result of increased predation rates, lack of abundance of prey, migratory obstacles (i.e. weather events, collision with structures, etc.), conversion of habitat from native to exotic vegetation, defoliation of saltcedar caused by tamarisk leaf beetles, increased fire risk, and climate change (Thompson 1961, McGill 1979, Wilcove et al 1986).

Fire is an imminent threat to cuckoo breeding habitat (Service 2014b). Although fires occurred to some extent in riparian habitats historically, many native riparian plants are neither fire-adapted nor fire-regenerated. Thus, fires in riparian habitats are typically catastrophic, causing immediate and drastic changes in plant density and species composition. Busch (1995) documented that the current frequency and size of fires in riparian habitats is greater than historical levels because reduced floods have allowed buildup of fuels, and because of the expansion and dominance of the highly flammable tamarisk. Tamarisk and arrowweed (*Pluchea sericea*) tend to recover more rapidly from fire than do cottonwood and willow.

The historic breeding range of the cuckoo included areas as from Canada to Mexico and from the Continental Divide to the Pacific Coast (Laymon and Halterman 1987). Similar to the flycatcher, declining cuckoo numbers have been attributed to loss, modification, and fragmentation of riparian breeding habitat (78 FR 61621). Changes to riparian ecosystems such as reductions in water flow, alteration of flood flows, physical modifications to watersheds and

streams, and removal of riparian vegetation have occurred as a result of dams and reservoirs, groundwater pumping, channelization of streams for flood control, livestock overgrazing, agriculture developments, urbanization and other modifications.

The action area is within an area proposed as critical habitat for the cuckoo. The Physical and Biological Features (PBFs) (referred to as Primary Constituent Elements in the proposed critical habitat listing of cuckoo critical habitat) are those elements in an area that provide for life-history processes and are essential to the conservation of the cuckoo. The PBFs listed in the proposed critical habitat for the cuckoo are the following:

1. Riparian woodlands. Riparian woodlands with mixed willow-cottonwood vegetation, mesquite-thorn-forest vegetation, or a combination of these that contain habitat for nesting and foraging in contiguous or nearly contiguous patches that are greater than 100 m (325 feet) in width and 81 ha (200 acres) or more in extent. These habitat patches contain one or more nesting groves, which are generally willow-dominated, have above average canopy closure (greater than 70 percent), and have a cooler, more humid environment than the surrounding riparian and upland habitats.
2. Adequate prey base. Presence of a prey base consisting of large insect fauna (for example, cicadas, caterpillars, katydids, grasshoppers, large beetles, dragonflies) and tree frogs for adults and young in breeding areas during the nesting season and in post-breeding dispersal areas.
3. Dynamic riverine processes. River systems that are dynamic and provide hydrologic processes that encourage sediment movement and deposits that allow seedling germination and promote plant growth, maintenance, health, and vigor (e.g., lower gradient streams and broad floodplains, elevated subsurface groundwater table, and perennial rivers and streams). This allows habitat to regenerate at regular intervals, leading to riparian vegetation with variously-aged patches, both young and old.

For more detailed information on the biology, status of the species and critical habitat, see the final listing and proposed designation of critical habitat rules (Service 2014a, 2014b), and recent BO (Service 2017). See the Environmental Baseline below for more details on the life history and demographics of the cuckoo.

## **ENVIRONMENTAL BASELINE**

Under section 7(a)(2) of the ESA, when considering the effects of the action on federally listed species, the Service is required to take into consideration the environmental baseline.

Regulations implementing the ESA (50 CFR 402.02) define 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.

## Status of the species and proposed critical habitat within the action area

Formal cuckoo surveys along the Rio Grande were started in 2006 from Isleta Pueblo to Elephant Butte Reservoir. The population has ranged from a low of 73 territories in 2011 to a high of 121 territories in 2012 (Carstensen et al. 2015). There were 98 cuckoo territories detected in 2017 (Dillon et al. 2018). Bureau of Reclamation uses seven of the flycatcher survey “reaches” to also conduct cuckoo presence/absence surveys. Because the reaches overlap, the Action Area is still within the southern portion of the San Acacia Reach and all of the Escondida Reach for cuckoos (Figure 2). From 2009 to 2017, along the Rio Grande within the San Acacia and Escondida Reach have had between 1 to 8 and 2 to 23 (respectively) cuckoo territories reported (Dillon et al. 2018). There were 16 cuckoo territories found within the Action Area during the 2017 breeding season (Dillon et al. 2018). The Action Area contains approximately 16 percent of the overall cuckoo territories in the middle Rio Grande (Dillon et al. 2018).

The habitat within the action area is composed of a variety of native and non-native vegetation including cottonwood, Goodding’s willow (*Salix gooddingii*), Russian olive and saltcedar (Crawford et al. 1993; Siegle and Ahlers 2017). Almost all of the action area (89%) is within proposed critical habitat. The action area consists of approximately 2812 ha (6949 acres) of critical habitat, which is approximately one percent of the 221,094 ha (546,335 acres) of critical habitat proposed rangewide (Service 2014b). Roughly 470 ha (1162 acres) of the action area is composed of non-native vegetation such as Russian olive and saltcedar (Siegle et al. 2013). This would be the area more likely to support cuckoo foraging activity (Ahlers et al. 2016). Roughly 21 ha (52 acres) of the action area is composed of native vegetation, which is the area more likely to have cuckoo breeding activity.

## Factors affecting species environment within the action area

### Groundwater and Low Flow Conveyance Channel

Vertical accumulation of sediment in a floodplain, exacerbated by the lateral confinement of the floodplain, results in a physical separation of riparian vegetation from groundwater necessary for flycatcher and cuckoo habitat (Dufour et al 2007; Service 2016b). This has happened to such an extent within the floodway, that productive pioneer species such as willows or cottonwoods have been replaced by either non-native (e.g., saltcedar) or upland plant species (Friedman and Auble 2000; Dufour et al. 2007; Decamps et al 2008).

The elevation of the water table in riparian areas within the floodway correlates with the surface water elevation in the channel and the drawdown effects of the Low Flow Conveyance Channel functioning as a drain (Corps et al. 2007). Groundwater elevation maps along the action area show less stable groundwater elevations and decreases in the areal extent of high water table conditions generally during the April to September period (Corps et al. 2007). Water table elevations below the ground surface vary from 1.2 to 1.5 m (4 to 5 ft) at Escondida, and from 1.5 to 3 m (5 to 10 ft) near San Antonio, New Mexico (Corps et al. 2007). Groundwater pumping for agricultural, mining, industrial, and municipal uses has resulted in water table declines along many rivers and is a major factor in the quality of riparian habitat (Briggs 1996; Service 2002). The net result of lowered water tables has been declines in river flow, with stress, injury and loss

of riparian vegetation. Topography, drainage patterns, soil types, depth to groundwater, groundwater flow direction and gradient, and other factors can affect the transport of water on and beneath the ground surface. These impacts are expected to be exacerbated as the river aggrades up to 3.7 m (12 ft), over time in the action area (Corps et al. 2007; Corps 2012).

The effect of activities that alter groundwater can lead to the reduction of water tables in or below riparian habitats that may support flycatchers and cuckoos (Service 2002). The floodplain of the Middle Rio Grande historically contained numerous marshes, swamps, meanders, oxbows and pools (Stotz 2000). In addition to providing evidence of channel shifting and flooding, such features also suggest a high water table within the floodplain (Graf et al. 2002). High water tables in floodplains and near river channels sustain extensive growth of riparian vegetation that provide breeding habitat for flycatchers and cuckoos (Service 2014b).

#### Saltcedar Leaf Beetle (*Diorhabda* spp.)

Saltcedar leaf beetle was released in 2001 (DeLoach et al. 2003) to control saltcedar. The saltcedar leaf beetle controls saltcedar by repeated leaf defoliation, which typically occurs during flycatcher and cuckoo breeding season (Tamarisk Coalition 2016). In 2012, saltcedar leaf beetle presence was observed along the Middle Rio Grande north of Albuquerque, NM. The saltcedar leaf beetle has now been observed along the Rio Grande throughout the majority of New Mexico (Tamarisk Coalition 2016).

Flycatchers have been recorded as using saltcedar for nesting while cuckoos are not suspected of using it for nesting, but cuckoos do use saltcedar for foraging (Ahlers et al 2016, Carstensen et al 2015). The defoliation of saltcedar habitat is suspected to decrease canopy cover which could change the microclimate and decrease the amount of nesting opportunities for flycatchers and foraging opportunities for cuckoos. Fire risk would also have the potential of increasing due to the increase of duff material present after defoliation events, at least in the short-term (Drus et al 2013).

#### Pollutants

Pesticide contamination can occur from agricultural activities, as well as from the cumulative impact of residential and commercial landscaping and other activities (Anderholm et al. 1995). Stormwater runoff, irrigation return, riverside drain return flows, and wind-blown processes contribute pesticides to the Rio Grande. Multiple sources have reported pesticides in Rio Grande water or sediment samples (Ong et al. 1991; Anderholm et al. 1995; Abeyta and Lusk 2004; Langman and Nolan 2005; NMED 2009; Marcus et al. 2010). For flycatchers and cuckoos, pesticide drift from adjacent agricultural fields can decrease the abundance of prey in riparian areas, which could lead to lower reproductive success and a decrease in population abundance (Laymon 1980, White 2004, Service 2014a).

#### Climate Change

Warming of the earth's climate is unequivocal, as is now evident from observations of increases in average global air and ocean temperatures, widespread melting of glaciers and the polar ice

cap, and rising sea level (Intergovernmental Panel on Climate Change [IPCC] 2007). The IPCC (2007) describes changes in natural ecosystems with potential widespread effects on many organisms. The potential for rapid climate change poses a significant challenge for fish and wildlife conservation. Species abundance and distribution is dynamic, and dependent on a variety of factors, including climate (Parmesan and Galbraith 2004). Typically, as climate changes, the abundance and distribution of fish and wildlife will also change. Highly specialized or endemic species are likely to be most susceptible to the stresses of changing climate. Based on these findings and other similar studies, the Department of the Interior requires agencies under its direction to consider potential climate change effects as part of their long-range planning activities.

The IPCC (2007) also projects that there will very likely be an increase in the frequency of hot extremes, heat waves, and heavy precipitation events. Climate forecasts project a northward shift in the jet stream and associated winter-spring storm tracks, which are consistent with observed trends over recent decades (Trenberth et al. 2007). This would likely result in future drier conditions for the Southwest and an ever increasing probability of drought for the region (Trenberth et al. 2007).

In consultation with leading scientists from the Southwest, the New Mexico Office of the State Engineer prepared a report for the Governor (New Mexico Office of State Engineer 2006) which made the following observations about the impact of climate change in New Mexico:

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

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

Enquist et al. (2008) found that 93 percent of New Mexico's watersheds have become relatively drier from 1970 to 2006 and that snowpack in New Mexico's major mountain ranges has declined over the past 2 decades in 98 percent of the sites analyzed. The timing of peak streamflow from snowmelt in New Mexico is an average of 1 week earlier than in the mid-20<sup>th</sup> century (Enquist et al. 2008). Watersheds with the greatest declines in snowpack are those that have experienced the greatest drying from 1970 to 2006.

Climate change is anticipated to have negative impacts on cuckoos and cuckoo habitat. These changes are anticipated to be 1) Less opportunities for overbank flooding events; 2) Increased depth to groundwater; and 3) An increased occurrence of extreme events such as fire. Less overbank flows would result in a less dynamic riparian system (i.e. less successional age classes of vegetation and fewer opportunities for rivers to naturally meander). Increased depth to groundwater would result in stressed vegetation and encourage transition from native to non-native vegetation. Wildfires can have a devastating effect on riparian habitat. The early vegetation succession state caused by wildfires is not suitable for cuckoo nesting activity.

### **ESA Consultations affecting the Species in the Action Area**

Within the action area, the following past and present federal, state, and private consultations have included effects analysis for the cuckoo and its proposed critical habitat:

- Consultation Number 02ENNM00-2012-F-0015. Biological Opinion for the U.S. Army Corps of Engineers San Acacia Levee Project. This consultation included construction of a new engineered levee within the 100-year floodplain of the Rio Grande from San Acacia Diversion Dam to the Tiffany Basin. Non-fatal take of two cuckoo territories was anticipated resulting from the groundwater changes and loss of critical habitat over the course of the Proposed Action. Additionally, up to one cuckoo territory per year (during the 20 year construction period) may occur as a result of noise disturbance (Service 2016a). The construction adjacent to the northernmost portion of the Action Area was completed during 2017. Further construction is on indefinite delay.
- Consultation Number 02ENNM00-2013-F-0033. Final Biological and Conference Opinion for Bureau of Reclamation, Bureau of Indian Affairs, and Non-Federal Water Management and Maintenance Activities on the Middle Rio Grande, New Mexico. This consultation included hydrology and river maintenance (including habitat restoration) along the Rio Grande from the Colorado/New Mexico state line to Elephant Butte Dam. A total of up to 838 ha (2,071 acres) of suitable cuckoo habitat was estimated to be impacted over the 15 year project period. The losses of habitat were estimated to be from reduction in overbank flows within the Rio Grande as well as in the Low Flow Conveyance Channel, river maintenance projects, and increased sedimentation within the floodplain (Service 2016b).
- Consultation Number 02ENNM00-2016-F-0287. Biological Opinion for the Bureau of Reclamation's and the New Mexico Interstate Stream Commission's construction activities to create habitat restoration sites along the west bank of the Rio Grande between River Mile 116 and River Mile 99 from 2016-2019. Habitat restoration for this project includes removal of portions of occupied cuckoo habitat. Incidental take in the form of displacement of one cuckoo territory near River Mile 100.5 is anticipated to occur as a result of project activities (Service 2016c).
- Consultation Number 02ENNM00-2017-F-0331. Biological Opinion for the Central Socorro Bosque Restoration Project Treatment Plan between River Mile 104 and River

Mile 90 from 2017-2019. This consultation included removing dead and non-native vegetation and habitat restoration with native vegetation. Non-fatal incidental take of 10 cuckoo territories was anticipated resulting from vegetation treatment activities of the Proposed Action (Service 2017).

## **EFFECTS OF THE ACTION**

Regulations implementing the ESA (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. Effects of the action are considered along with the environmental baseline and the predicted cumulative effects to determine the overall effects to the species for purposes of preparing a BO on the Proposed Action (50 CFR 402.02).

There are no interdependent or interrelated actions associated with the Proposed Action that the Service is currently aware of. Also, there are no direct adverse effects anticipated for cuckoos based on the conservation measures to avoid vegetation removal or treatment from May 1 to September 1 (which would avoid the cuckoo breeding season and the timeframe when cuckoos are present within the action area) and the 150 m (500 feet) “no treatment zone” buffer around occupied territories. Revegetation work may occur during spring and summer; however, there are no direct effects anticipated since areas will already have vegetation removed and no cuckoos are expected to be present.

Indirect adverse effects to the cuckoo and its proposed critical habitat are likely to occur as a result of the Proposed Action. Proposed critical habitat within the action area has historically been occupied by cuckoos, and would be assumed to be occupied again due to their site fidelity. The proposed removal or thinning of habitat by various proposed techniques is anticipated to decrease canopy cover or foraging opportunities within historically occupied areas, which is anticipated to cause adverse effects to cuckoos by causing them to seek alternative breeding or foraging habitat. Additionally, if cuckoos return to nesting sites that have been treated, the decreased amount of vegetative cover in the understory could increase their nest predation, make nestlings more susceptible to weather elements, or decrease prey base for growth and survival. The 547 ha (1351 acres) of treatment proposed will impact a total of nine historically occupied cuckoo territories over the 1.5-year BO duration indirectly as a result of the proposed action taking place within the Action Area.

The adverse effects to cuckoo and proposed critical habitat are anticipated to be temporary, lasting approximately five years. Non-native treatment or removal as well as revegetation activities would take place over the course of two to three years and with a phased approach. Revegetation including planting cottonwood and willow poles, and remaining pockets of native vegetation (not removed from the Proposed Action) should allow for a mosaic of habitat, as

opposed to a large scale removal and replanting of habitat all at once. In addition, the proposed treatment of non-native vegetation may reduce the risk of fire to adjacent patches of higher quality native vegetation.

Restoration of 69 ha (171 acres) of higher quality native species is also proposed, which will benefit the species with nesting habitat once established. The species of vegetation to be planted will vary depending on groundwater conditions. In general, areas within the floodway with shallow depths to groundwater (e.g. occupied nesting habitat, or areas close to the river) will be planted with cottonwoods and willow species. This planting regime would either replace the thinned understory in historic nesting habitat, or could provide new patches of vegetation with structure that could accommodate cuckoo breeding activity in as little as three years if hydrological conditions allow (Halterman et al. 2016). Additionally, low quality foraging habitat for cuckoos would be replaced through restoration in 82 ha (203 acres) more upland in nature but within the floodway. Though the Proposed Action does not replace the full 547 ha (1351 acres) of treatment area with native vegetation, it will be replacing the current habitat with higher quality habitat once established.

The cuckoo does not currently have an associated Recovery Plan, however, the Proposed Action is ultimately expected to benefit the cuckoo and cuckoo proposed critical habitat into the future and support recovery by increasing the areas dominated by native vegetation preferred by cuckoos for feeding and breeding. The short term (approximately five years until higher quality vegetation becomes established) adverse effects would impact a small percentage of habitat available to the cuckoo for foraging and breeding activities. The action area consists of approximately 2812 ha (6949 acres) of proposed critical habitat, which is approximately one percent of the 221,094 ha (546,335 acres) of critical habitat proposed rangewide (Service 2014b).

## **CUMULATIVE EFFECTS**

Cumulative effects include the effects of future state, tribal, local or private actions that are reasonably certain to occur in the Action Area considered in this BO (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.

## **CONCLUSION**

In accordance with policy and regulation, the jeopardy analysis in this BO relies on four components: 1) the Status of the Species, which evaluates the cuckoo rangewide condition, the factors responsible for that condition, and their survival and recovery needs; 2) the Environmental Baseline, which evaluates the condition of the cuckoo in the Action Area, the factors responsible for that condition, and the relationship of the to the survival and recovery of the cuckoo; 3) the Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the cuckoo; and 4) Cumulative Effects, which evaluates the effects of future, non-Federal activities in the Action Area on the cuckoo.

The jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the cuckoo current status, taking into account any cumulative effects, to determine if implementation of the Proposed Action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the cuckoo in the wild.

The Service and the National Marine Fisheries Service published a final rule in 2016 (81 FR 7214), revising the definition for destruction or adverse modification of critical habitat in the Act's implementing regulations at 50 CFR 402.02. The final regulatory definition is: "Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features." This BO analyzed the effects of the action and its relationship to the function and conservation role of cuckoo proposed critical habitat, to determine whether the current proposal destroys or adversely modifies critical habitat for the cuckoo.

After reviewing the current status of the cuckoo, the environmental baseline for the action area, and the effects of Socorro County's proposed Wildfire Hazard Mitigation Project, it is the Service's biological opinion that the action, as proposed, is not likely to jeopardize the continued existence of the cuckoo, and is not likely to destroy or adversely modify proposed critical habitat. While this 1.5 year Proposed Action is being implemented, the adverse effects to survival of adults and fledglings are either 1) Not measurable; 2) Nearly discountable; or 3) Offset by an estimated improved survival rate once revegetation efforts are established.

We present these conclusions for the following reasons:

- Vegetation removal and treatment activities for the Proposed Action will occur outside of the breeding season at a time when cuckoos are not present within the action area. Revegetation and planting activities during the breeding season will not result in direct adverse effects to the cuckoo.
- The Proposed Action will replace occupied non-native habitat with higher quality native habitat, enhancing the habitat into the future.
- The Proposed Action will provide a reduced risk of fire danger, thereby providing protection for adjacent riparian proposed critical habitat.
- The Proposed Action includes a "phased" approach which will leave a mosaic of vegetation during the breeding season following treatments.
- The scale of the Proposed Action is small in comparison to the surrounding available habitat for cuckoo foraging and breeding activity, as well as to the rangewide habitat for the species.

The conclusions of this biological and conference opinion are based on full implementation of the project as described in the Description of the Proposed Action section of this document, including any Conservation Measures that were incorporated into the project design.

## **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 (50 CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by FEMA in that they become binding conditions of any grant or permit issued to Socorro County, as appropriate, for the exemption in section 7(o)(2) to apply. FEMA has a continuing duty to regulate the activity covered by this incidental take statement. If FEMA or Socorro County: 1) fails to assume and implement the terms and conditions, or 2) fails to require the (applicant) to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, FEMA and Socorro County must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR 402.14(i)(3)].

## **AMOUNT OR EXTENT OF TAKE**

The Service finds it will be impractical to express a numerical measure of take for cuckoos for the following reasons: The species may fail to nest, it may be detrimental to monitor egg or nestling mortality, nest sites may be abandoned, individuals may be difficult to detect, and the species is mobile. It is difficult to detect this species in dense riparian habitat; therefore, finding a dead or impaired specimen is unlikely, or losses may be masked by other causes.

The Service chose acres of proposed critical habitat and 2017 population totals within the Action Area as a surrogate for incidental take. Due to habitat loss resulting from the Proposed Action, cuckoos may abandon nesting sites, experience nesting failures, or shift their territories. Based on the occupied proposed critical habitat from 2017, we anticipate that adverse impacts to 547 ha (1,351 acres) may result in the displacement of no more than nine cuckoo territories over the 1.5 year BO duration. Incidental take of cuckoos will be considered exceeded if more than 547 ha (1,351 acres) of historically occupied proposed critical habitat are impacted and if there is less than 69 ha (171 acres) of nesting habitat restoration as a result of the Proposed Action.

## **EFFECT OF THE TAKE**

In this BO, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species or destruction or adverse modification of proposed critical habitat.

## **REASONABLE AND PRUDENT MEASURES AND TERMS AND CONDITIONS**

In order to be exempt from the prohibitions of section 9 of the Act, FEMA must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

The following reasonable and prudent measure and terms and conditions are necessary and appropriate to minimize take of cuckoos:

1. FEMA will work with Socorro County to monitor and report on the populations of the flycatcher, cuckoo and their habitats in the Action Area;
  - 1.1. FEMA or Socorro County shall conduct flycatcher and cuckoo protocol surveys annually throughout the Action Area (if not already being completed by other entities).
  - 1.2. FEMA or Socorro County shall ensure flycatcher and cuckoo protocol surveys are performed by biologists that possess a Section 10(a)(1)(A) permit (if not already being completed by other entities).
2. FEMA and Socorro County will standardize and implement all BMPs that minimize effects to listed species;
  - 2.1. FEMA or Socorro County shall standardize and implement all BMPs that pertain to equipment and operations, staging and access, project timing, water quality, dust abatement, exclusion, silt fence installation, and others for their Proposed Action.
  - 2.2. FEMA or Socorro County shall seek to minimize their activities, noise, and disturbances within the seasonal and geographic buffer areas associated with flycatcher and cuckoo nesting/territorial/feeding behaviors. Specifically, all parties shall adhere to the seasonal and geographic avoidance of vegetation clearing activities during the breeding season (April 15-September 1), or coordinate with the Service (NMESFO) when seasonal or geographic restrictions cannot be implemented as proposed.
  - 2.3. Habitat restoration and maintenance projects shall minimize native plant disturbance to the extent possible or replace native plants with cottonwood or coyote willow poles at a 10:1 ratio. Invasive species removed shall be replaced with native species.
  - 2.4. FEMA or Socorro County shall ensure that all Conservation Measures described in the BA and the BO are implemented.
3. FEMA and Socorro County will minimize take of flycatchers and cuckoos due to treatment and habitat restoration activities;

- 3.1. FEMA or Socorro County shall coordinate with the NMESFO to avoid any flycatcher or cuckoo nests found in treatment areas (if not already being completed by other entities).
  - 3.2. Long term (10 years) maintenance operation programs will include requirements that ensure the contractor's compliance with all pertinent terms and conditions of the Service's Incidental Take Statement; pertinent information on the presence or locations of flycatcher or cuckoos; and requisite work restrictions. As needed, FEMA or Socorro County will formally update pertinent information and requirements throughout the duration of the contract.
4. FEMA or Socorro County will annually report to the Service on implementation of the Proposed Action, the annual ITS summary, the RPMs, and their implementing terms and conditions.
- 4.1. FEMA or Socorro County shall coordinate the appropriate reporting of the listed species and their habitat monitoring data and all associated management actions that affect these species or their habitats on an annual basis (if not already being completed by other entities).
  - 4.2. FEMA or Socorro County shall report to the Service in accordance with 10(a)(1)(A) permits (if not already being completed by other entities).
  - 4.3. FEMA or Socorro County shall report by March 1st, of each year, and provide electronic copies of reports and plans to the Service on implementation of all RPMs and their associated Terms and Conditions.
  - 4.4. FEMA or Socorro County shall report to the Service any spills of hazardous chemicals including fuels, hydraulic fluids, and other hazardous materials in toxic amounts associated with the Proposed Action activities that occur in the floodplain.
  - 4.5. Annual reports shall reference the appropriate Consultation Number 02ENNM00-2018-F-0260, and should be delivered electronically to email address [nmesfo@fws.gov](mailto:nmesfo@fws.gov).
  - 4.6. Annual reports shall be provided to Bureau of Reclamation (Middle Rio Grande Program Area, Environment and Lands Division, Albuquerque Area Office, Lori Walton, [lwalton@usbr.gov](mailto:lwalton@usbr.gov)) to assist with efforts to track non-native vegetation treatment areas and available SWFL suitable habitat.

### **Disposition of Dead or Injured Listed Species**

Upon locating a dead, injured, or sick listed species initial notification must be made to the Service's Law Enforcement Office, P.O. Box 1306, Albuquerque, NM 87103-1306, 505-248-7889 within 3 working days of its finding. Written notification must be made within 5 calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office via email at [nmesfo@fws.gov](mailto:nmesfo@fws.gov). Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve the biological material in the best possible state.

## CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the 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 conservation recommendations identified below may be implemented by FEMA and Socorro County. Conservation recommendations may be recovery actions that are not currently being undertaken.

1. Continue to work with private landowners, state and other federal agencies to maximize restoration activities (e.g. promoting restoration of cuckoo and flycatcher nesting habitat) within the Action Area.
2. Work with area land managers, private landowners, and other stakeholders to develop a wildfire prevention and restoration plan for flycatcher and cuckoo habitat.
3. Continue to work with landowners to promote environmental stewardship and conservation of the flycatcher, cuckoo, and their habitats.
4. Continue to implement additional ecosystem restoration activities on broad scale.
5. Inform partners and the public about saltcedar beetle issues. Continue to improve an understanding about saltcedar issues using the latest science.
6. Control feral hogs as needed.
7. Coordinate management of livestock grazing to minimize impacts to flycatchers, cuckoos, and their habitats.
8. Continue to coordinate with fire management agencies to prepare for and reduce bosque loss to fires.
9. FEMA or Socorro County should work with the NMESFO to conduct annual tours of the Action Area to assess progress in implementing activities described in this BO.

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

Incidental take of cuckoos will be considered exceeded if more than 547 ha (1,351 acres) of historically occupied proposed critical habitat are impacted and if there is less than 69 ha (171 acres) of nesting habitat restoration as a result of the Proposed Action.

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.

Through formal conferencing, the Service has determined the Proposed Action is “not likely to destroy or adversely modify” cuckoo proposed critical habitat. Upon designation of critical habitat, you may request the Service to confirm the conference opinion as a BO issued through this formal consultation. Such a request must be in writing, and if the Service reviews the Proposed Action and finds no significant changes in the Proposed Action or the information used during this conference, the Service will confirm the conference opinion as the BO, and no further section 7 consultation will be necessary.

The Service appreciates FEMA’s efforts to identify and minimize effects to listed species from this project. For further information, please contact Vicky Ryan at 505-761-4738, [vicky\\_ryan@fws.gov](mailto:vicky_ryan@fws.gov), or Clinton Smith at 505-761-4743, [clinton\\_smith@fws.gov](mailto:clinton_smith@fws.gov). Please refer to the Consultation Number 02ENNM00-2018-F-0260, in future correspondence concerning this project.

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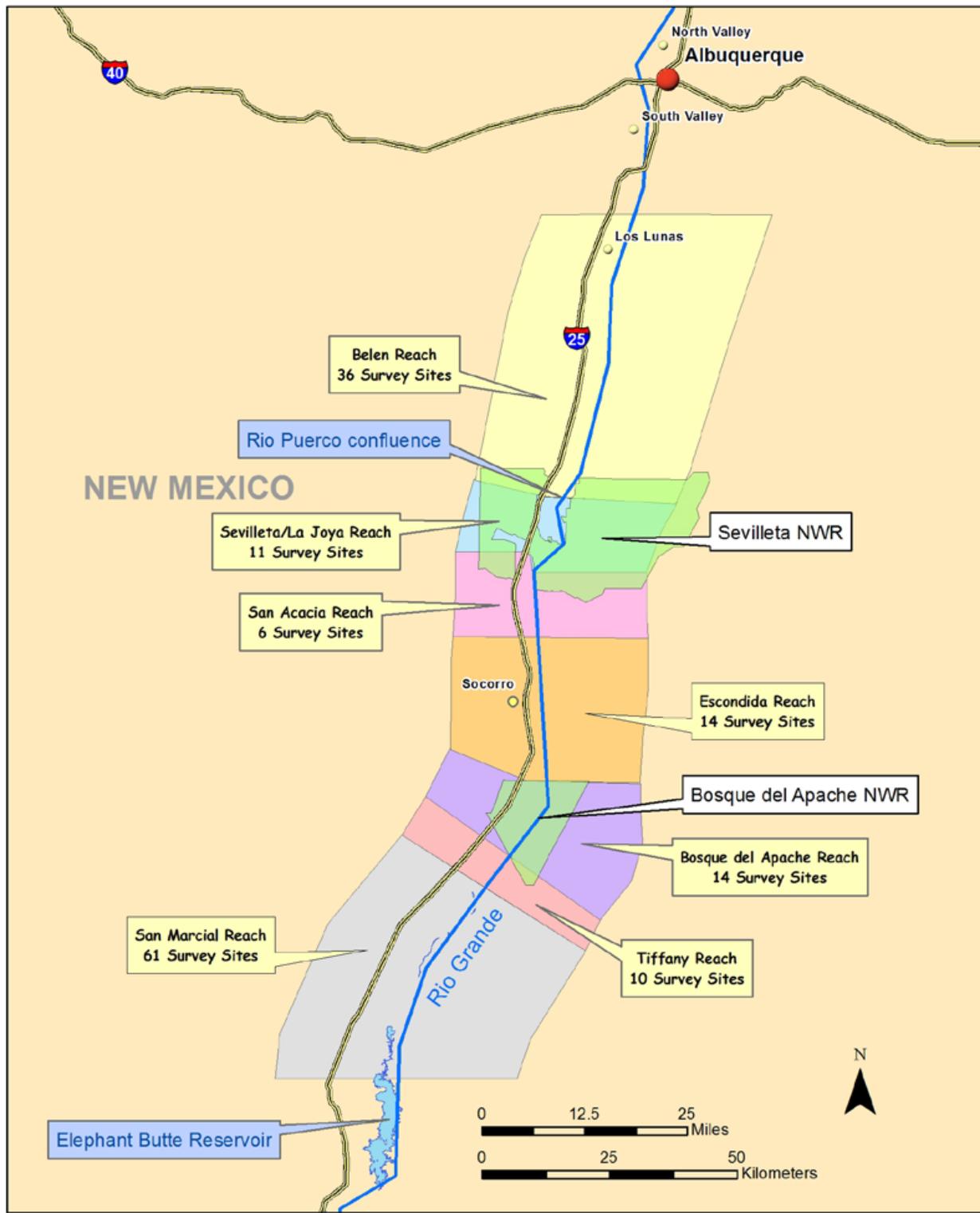
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Figure 1. Action Area Map (from Dello Russo 2017)



\* Please note: The length of the survey site reaches from north to south along the Rio Grande are exact, whereas the width from west to east is exaggerated for viewing purposes. Most survey sites are within 1 mile (east or west) of the Rio Grande.

Figure 2. Yellow-billed cuckoo middle Rio Grande study area (from Dillion et al. 2018).