United States Department of the Interior

FISH AND WILDLIFE SERVICE

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March 15, 2017

Cons. No.02ENNM00-2017-F-0331

Memorandum

To: Area Manager, Bureau of Reclamation, Albuquerque Area Office, Albuquerque, New Mexico (Attn: Jennifer Faler)

From: Field Supervisor, Fish and Wildlife Service, New Mexico Ecological Services Field Office (NMESFO), Albuquerque, New Mexico

Subject: Biological and Conference Opinion for the Central Socorro Bosque Restoration Project Treatment Plan, Consultation Number 02ENNM00-2017-F-0331

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 U.S.C. 1531-1544; ESA), as amended. The Bureau of Reclamation's (Reclamation) Biological Assessment (BA) was dated March 3, 2017. At issue are impacts that may result from New Mexico State Forestry's proposed 2-year Central Socorro Bosque Restoration Project Treatment Plan located on Reclamation's land in Socorro, New Mexico (Proposed Action). The end date for this Proposed Action is estimated to be at the end of the Summer in 2019. You determined that the Proposed Action may affect and is likely to adversely affect the Yellow-billed Cuckoo (*Coccyzus americanus*) (cuckoo) and its proposed critical habitat of the species.

You determined that the Proposed Action is not likely to adversely affect the Southwestern Willow Flycatcher (*Empidonax traillii extimus*) (flycatcher) and its critical habitat. We concur with your determination based on the conservation measures proposed within your BA as well as the proximity of the project area being outside of 2016 flycatcher occupied territories. Though flycatcher designated critical habitat falls within the action area, the critical habitat to be treated will ultimately be replaced with higher quality vegetation that is anticipated to benefit the species. In addition, the treatment measures identified within the Proposed Action will also reduce fire risk which will protect adjacent critical habitat.

Your BA also addressed 13 additional species and their critical habitat where "no effect" determinations were made. Though the Service does not provide concurrence for "no effect" determinations, we appreciate your consideration of the species.

This biological and conference opinion (BiOp) is based on information provided in your March 3, 2017 BA, the meeting held in Socorro, NM on February 13, 2017 about the Proposed Action, field investigations, email exchanges, and other sources of information. Literature cited in this BiOp is not a complete bibliography of all literature available on cuckoos, their habitat, or on potential effects to the species considered in this BiOp. A complete administrative record of this consultation is on file at the NMESFO.

The Service appreciates Reclamation'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 David Campbell at 505-761-4745. Please refer to the consultation number, 02ENNM00-2017-F-0331, in future correspondence concerning this project.

cc:
Division Manager, Environment and Lands Division, Bureau of Reclamation, Albuquerque Area Office, Albuquerque, New Mexico (electronic copy)
Senior Biologist, Environment and Lands Division, Bureau of Reclamation, Albuquerque Area Office, Albuquerque, New Mexico (electronic copy) (attn.: Lori Walton)

Director, New Mexico Department of Game and Fish, Santa Fe, New Mexico (electronic copy)
Socorro District Forester, New Mexico Energy, Minerals and Natural Resources Department, Socorro, New Mexico (electronic copy) (attn: Doug Boykin)
Planning Specialist, Middle Rio Grande Conservancy District, Albuquerque, New Mexico (electronic copy) (Attn: Yasmeen Najmi)
Secretary, Save Our Bosque Task Force, Socorro, New Mexico (electronic copy)

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The action area is considered the reach of the Rio Grande extending from the Socorro North Flood Control Feature (approximately RM 104), south to Brown Arroyo Outflow (approximately RM 90) (Figure 1). The land is owned by the Department of Interior, Bureau of Reclamation. Riparian bosque habitat on both sides of the river is included within this action area, however, construction activities will only take place on portions of the west side of the Rio Grande and no activities will occur in the river. The purpose of the Proposed Action is to guide restoration of the riparian forest (bosque) within the action area using funding appropriated by the 2017 NM State Legislature. The entire Proposed Action will be implemented by New Mexico State Forestry who is the recipient of the funding. The Proposed Action objectives include:

- Removing dead or non-native vegetation and replacing with native species.
- Protecting, extending, and enhancing riparian vegetation in noncontiguous areas in the floodplain.
- Managing the buffer zone of the contiguous bosque to protect ecosystem processes, enhancing wildlife habitat values, and maintaining rural and semirural conditions.
- Restoring native vegetation that can prevent catastrophic wildfires in the bosque.
- Sustaining and enhancing existing cottonwood (*Populus* spp.) communities, and creating new native cottonwood communities wherever possible.

The project will consist of three distinct treatment types followed by planting of native species where soils and water table depth are favorable. The treatment types include mechanical removal of target species using either 1) chainsaws or hand crews; 2) masticators; or 3) track hoes with hydraulic "thumbs" to "pluck and pile" the target species. All mechanical treatments will be followed by an initial herbicide treatment and then a follow-up herbicide treatment within six months (for a more detailed description see Reclamation 2017). Treatment sites are referred to as "Severance Sites".

The species targeted for removal will consist primarily of saltcedar (*tamarisk* spp.) and Russian olive (*Elaeagnus angustifolia*), with some Elm (*Ulmus* spp.), Mulberry (*Morus* spp.), and Tree-of-heaven (*Ailanthus altissima*) seedlings, saplings and trees being removed also. Following the completion of the initial removal of the target species and initial herbicide treatment, planting of cottonwood and willow (*Salix* spp.) or other upland or riparian species will be initiated where applicable based on soil types, availability to ground water and slash/mastication depth.

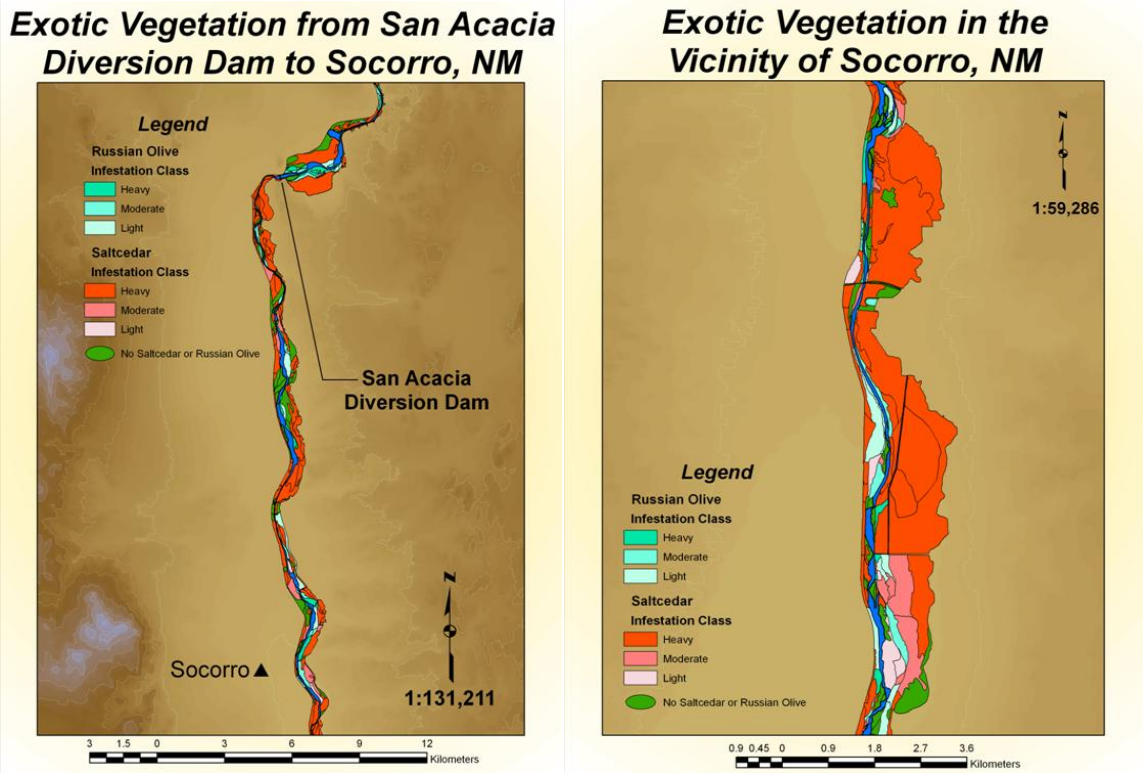

Figure 1. Areas with non-native vegetation within the action area (from Reclamation 2017).

Conservation Measures:

- The vegetation removal will be phased over two migratory bird seasons to avoid impacts to federally-listed and other migratory bird species within one season. The two phases are as follows: Phase 1 – Spring 2017 (122.8 hectare [ha] {303.5 acres}) and Phase 2 – Fall 2017 to Spring 2018 (139.6 ha [345 acres]). Phase 1 will include any areas outside of the 500 meter (1,640 feet [ft]) area occupied by cuckoos in 2016 (Figures 2-5). Severance Site 1 was not included in the figures because no cuckoo territories are located where treatment will take place. No vegetation removal or treatment work will occur during migratory bird season of April 15 to September 1. Revegetation has been tentatively planned for Spring-Summer 2018 (41.5 ha [102.5 acres]) and Spring-Summer 2019 (66.2 ha [163.5 acres]), based on plant availability and progress of initial treatment in planting areas. The revegetation actions that would occur during the summer breeding season would consist of watering previously planted vegetation and spreading grass seed.
- Two basic criteria were used to determine plant establishment areas as part of the Proposed Action: 1) plantings will be focused in areas where young saltcedar are removed to provide forage for cuckoos and 2) native understory plantings will be done where non-native plants are removed under gallery forest cottonwood trees. This strategy of planting in the understory of cottonwood galleries is to increase cover in the understory and benefit cuckoos. The groundwater table is suspected of limiting the establishment of cottonwoods and willow species in certain areas. But, where possible, cottonwoods will be established to provide structural diversity to planting patches.

- Impacts to terrestrial habitats would be minimized by using existing roads whenever possible. Therefore, no new roadways will be created. 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.
- All necessary permits for access points, staging areas, and study sites would be acquired prior to construction activity.
- Native vegetation at work sites would be avoided to the extent possible. If large, native woody vegetation (primarily cottonwood) needs to be trimmed or removed, they would be replaced at a ratio of 10:1.
- No work will occur in the river.

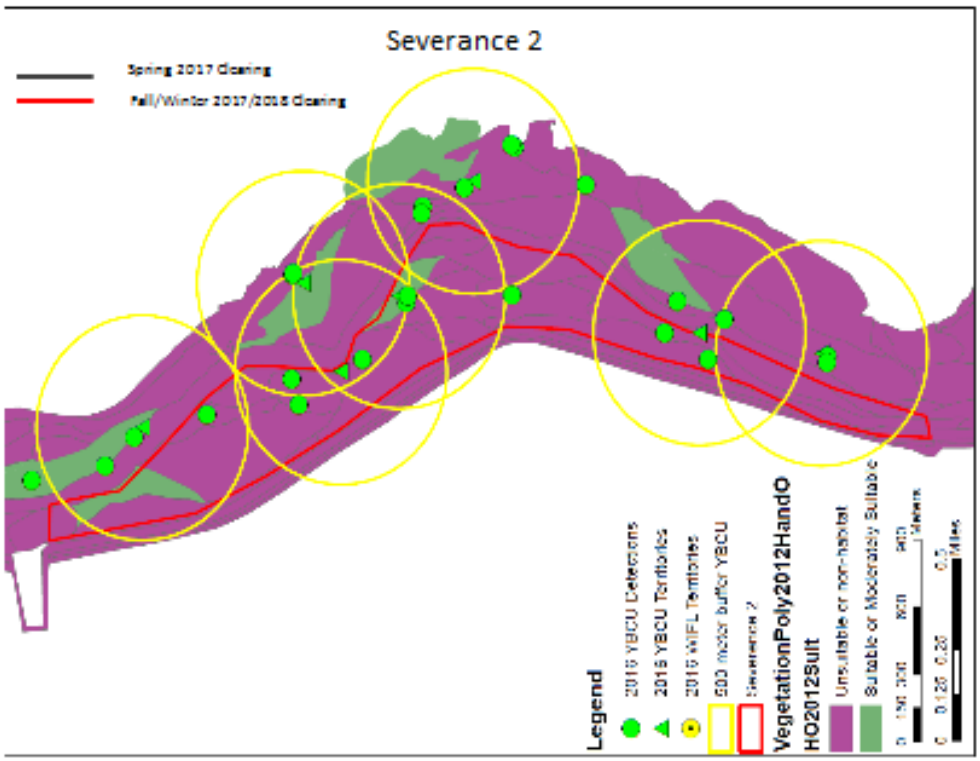

Figure 2. Severance 2 treatment area to be treated during Phase 2.

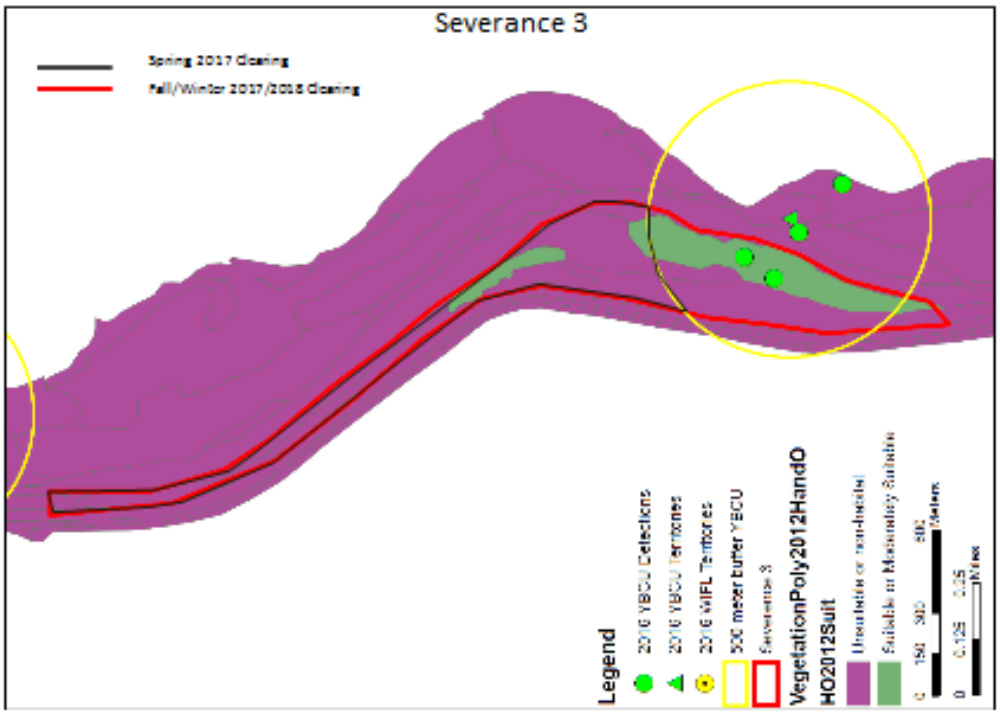

Figure 3. Severance 3 treatment area and timeline for clearing to avoid cuckoo territories.

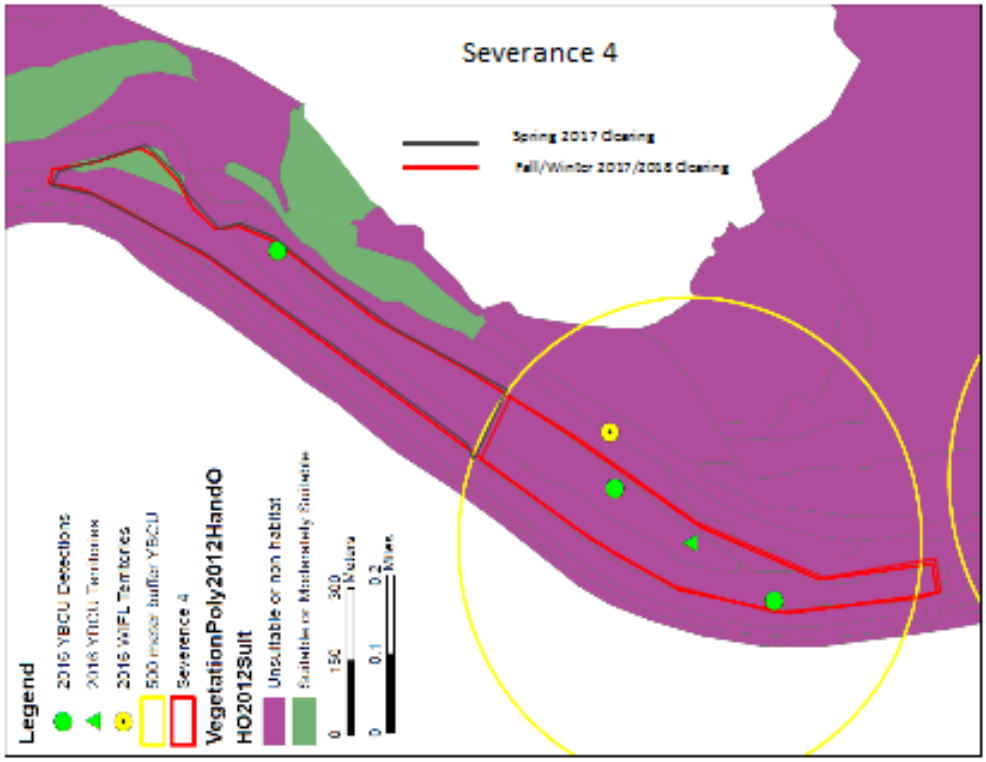

Figure 4. Severance 4 treatment area and timeline for clearing to avoid cuckoo territories.

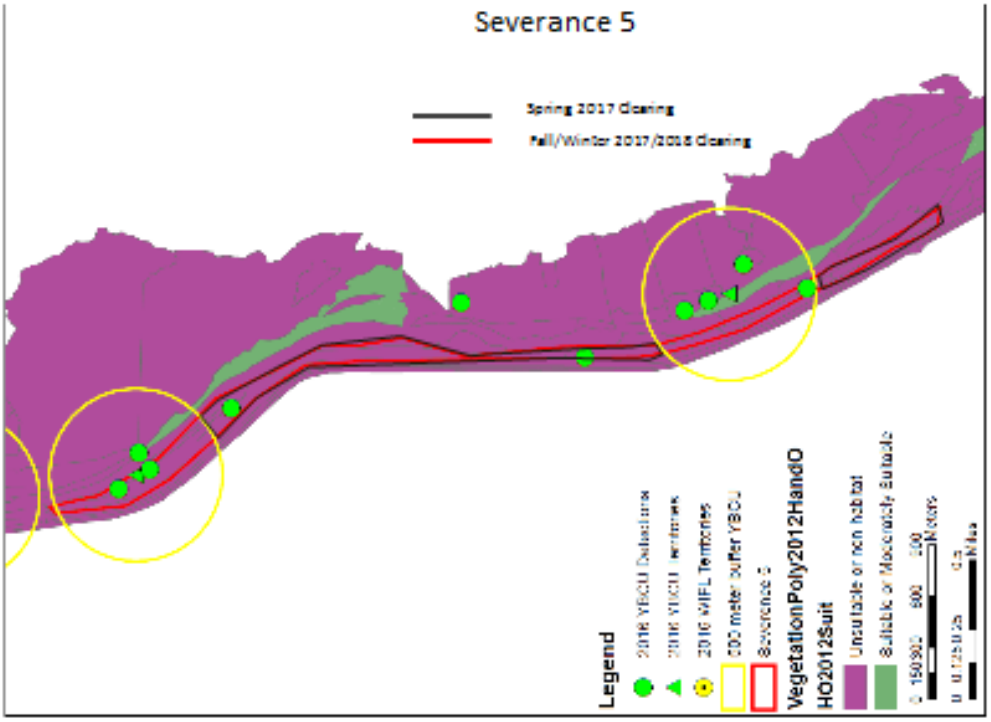

Figure 5. Severance 5 treatment area and timeline for clearing to avoid cuckoo territories.

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 2014b). 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). The Service (2013) estimated the number of territories of the cuckoo population in these states as summarized in Table 1. Northwestern Mexico and Arizona are believed to have the largest populations of cuckoos, range wide (Table 1). New Mexico also contains important breeding habitat for cuckoos with approximately 15 percent of the estimated population found within the state.

Table 1. Estimated rangewide cuckoo territory numbers (78 FR 61621).

State	Estimated number of territories
Arizona	170-250
California	40-50
Colorado	< 10
Idaho	10-20
Nevada	< 10
New Mexico	100-155
Northwestern Mexico	330-530
Utah	10-20
Western Texas	< 10
Wyoming	< 5
Total	680-1025

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 ft) 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 meters (m) (80 ft) 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).

The action area is within an area proposed as critical habitat for the cuckoo. The action area contains some of the primary constituent elements (PCE's) of cuckoo proposed critical habitat. The following are those elements of the physical or biological features that provide for life-history processes and are essential to the conservation of the cuckoo (Service 2014b):

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 ft) 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, Service 2014a, 2014b.

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 110 cuckoo territories found during the 2015 breeding season (Ahlers et al. 2016). In 2013 to 2016, along the Rio Grande within the action area there have been between 7 to 22 cuckoo territories reported from permitted individuals.

The habitat within the action area is composed of a variety of native and non-native vegetation including cottonwood, willows, Russian olive and saltcedar. The entirety of the action area is within proposed critical habitat. The action area consists of approximately 1,619 ha (4000 acres) of critical habitat, which is a small subset compared to the 221,094 ha (546,335 acres) of critical habitat proposed rangewide (Service 2014b). Roughly 364 ha (900 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 162 ha (400 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 cuckoo habitat (Dufour et al 2007; Service 2016). 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 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 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 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).

Though cuckoos are not suspected of nesting within saltcedar, foraging activity has been consistently documented within saltcedar in recent years (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 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 cuckoos, pesticide drift from adjacent agricultural fields can decrease the abundance of large insects in riparian areas, which could lead to lower reproductive success and a decrease in population abundance (Laymon 1980, White 2004, Service 2014a).

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. 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).
- 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).

Importance of the Action Area to the Survival and Recovery of the Species

There is not a current Recovery Plan for the cuckoo; however, in order to be well protected against disease and catastrophe, one would presume the species should be well distributed geographically to protect genetic diversity and a source population. The majority of the cuckoo population along the Rio Grande is located within the historically flooded portion of Elephant Butte Reservoir. Within the cuckoo proposed critical habitat Unit 52: NM-8 Middle Rio Grande 1, a total of 110 cuckoo territories were located, 12 of which occurred within the action area in 2015 (Ahlers et al 2016) (Figure 6). The action area consists of approximately 1,619 ha (4000 acres) of critical habitat, which is a small subset compared to the 221,094 ha (546,335 acres) of critical habitat proposed rangewide (Service 2014b). In addition, the area to be treated is mainly composed of lower quality non-native vegetation that is typically used for cuckoo foraging as opposed to breeding habitat.

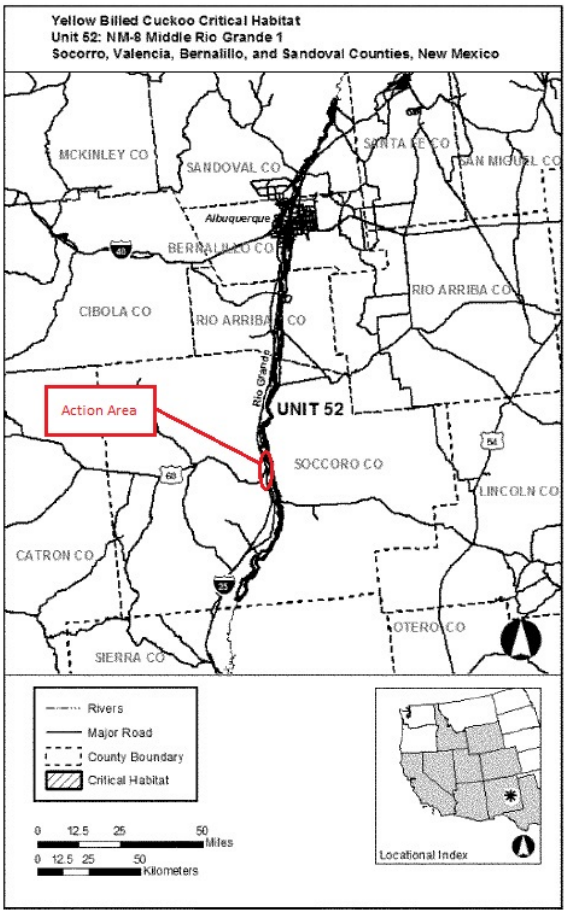

Figure 6. Approximate location of action area relative to proposed critical habitat Unit 52.

EFFECTS OF THE ACTION

Effects of the action refer to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated and interdependent with that action that will be added to the environmental baseline. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification. Interdependent actions are those that have no independent utility apart from the action under consideration. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur.

There are no direct adverse effects anticipated for cuckoos based on the conservation measures to avoid vegetation removal or treatment from April 15 to September 1, which would avoid the cuckoo breeding season and the timeframe when cuckoos are present within the action area. 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 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 cuckoo by causing them to seek alternative breeding or foraging habitat. Additionally, if cuckoos return to their 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 262 ha (648 acres) of treatment proposed will impact a total of 10 historically occupied cuckoo territories over the 2-year BiOp duration indirectly as a result of the proposed action taking place within the sites described as Severance 2, 3, 4 and 5 (Figures 2-5).

The adverse effects to cuckoos 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 years and with a phased approach. This would 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.

The Proposed Action includes 262 ha (648 acres) of non-native species treatment or removal. This acreage was divided into classifications of impacts: 1) areas not occupied by cuckoos and lacking critical habitat PCE's; 2) areas occupied by cuckoos, but without the structure present for nesting activity and used strictly for foraging; or 3) occupied potential nesting areas where hand thinning of non-native vegetation with chainsaws would occur (Table 2).

Table 2. Cuckoo critical habitat impacts organized by use and occupancy.

Impact Classification	Acreage	Percent of Proposed Action
Unoccupied habitat, lacking PCE's	248	38%
Occupied habitat, but lacks structure for nesting activity	256	40%
Occupied nesting habitat (understory thinning only)	144	22%

Revegetation of 108 ha (266 acres) of higher quality native species is also proposed, which will benefit the species 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). Areas more upland in nature and within the floodway that are currently providing foraging habitat for cuckoos would be replaced with native upland species that would also provide foraging habitat once established. Though the Proposed Action does not replace the full 262 ha (648 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 1,619 ha (4000 acres) of critical habitat, which is a small subset (less than 1%) compared to 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 biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

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-20th century (Enquist et al. 2008). Watersheds with the greatest declines in snowpack are those that have experienced the greatest drying from 1970 to 2006.

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.

CONCLUSION

In accordance with policy and regulation, the jeopardy analysis in this BiOp 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 BiOp 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 proposed critical habitat for the cuckoo.

After reviewing the current status of the cuckoo, the environmental baseline for the action area, the effects of the proposed Central Socorro Bosque Restoration Project Treatment Plan and the cumulative effects, 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 two year Proposed Action is being implemented, the adverse effects to survival of adults and fledglings are either 1) Not measureable; 2) Nearly discountable; or 3) Offset by an estimated improved survival 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 seasons 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 Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined (50 CFR 17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The measures described below are non-discretionary, and must be undertaken by Reclamation so that they become binding conditions of any grant or permit issued to New Mexico State Forestry, as appropriate, for the exemption in section 7(o)(2) to apply. Reclamation has a continuing duty to regulate the activity covered by this incidental take statement. If Reclamation (1) fails to assume and implement the terms and conditions or (2) fails to require the New Mexico State Forestry 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, Reclamation 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 occupied proposed critical habitat 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 2016, we anticipate that adverse impacts to 155 ha (383 acres) may result in the displacement of no more than 10 cuckoo territories over the 2-year BiOp duration. Incidental take of cuckoos will be considered exceeded if more than 155 ha (383 acres) of historically occupied proposed critical habitat are impacted as a result of the Proposed Action over the 2-year BiOp duration.

EFFECT OF THE TAKE

In the accompanying biological opinion, 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, Reclamation 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. Minimize adverse effects of the proposed action on cuckoo habitat for survival and recovery.
    - 1.1 Reclamation shall report the end result of the action and its impact on the species within 90 days of completion of the action to the NMESFO. An additional report shall be submitted 3 years post project assessing the success of revegetation activities and cuckoo distribution, and determine if further planting or treatment would be recommended.
    - 1.2 Reclamation will continue annual presence/absence surveys for cuckoos within the action area and adjacent habitat as well as update vegetation mapping efforts as appropriate.
    - 1.3 Reclamation will coordinate with New Mexico State Forestry to ensure noise disturbance from summer watering and seeding activities are kept to a minimum should they occur within 500 meters of future occupied cuckoo territories.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the proposed action. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. Reclamation must immediately provide an explanation of the causes of the take and review with the NMESFO the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

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

1. Continue to work with local citizens and agencies to add to the current understanding of saltcedar and saltcedar leaf beetle issues using the latest science.
2. Continue to work with local citizens and agencies to further prepare for and reduce bosque loss to fires.
3. Remove jetty jacks where possible.
4. Monitor groundwater levels, as needed for revegetation effort success.

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 155 ha (383 acres) of historically occupied proposed critical habitat are impacted as a result of the Proposed Action over the 2-year BiOp duration.

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 BiOp 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 BiOp, and no further section 7 consultation will be necessary.

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