United States Department of the Interior

FISH AND WILDLIFE SERVICE

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May 25, 2016

Memorandum

To: Area Manager, Bureau of Reclamation, Albuquerque Area Office, Albuquerque, New Mexico

From: Field Supervisor, U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office, Albuquerque, New Mexico

Subject: Biological Opinion on effects of actions associated with the proposed continuation of the Rio Grande Project Operating Agreement and storage of San Juan-Chama Project water in Elephant Butte Reservoir, New Mexico

Thank you for provision of the November 18, 2015, U.S. Bureau of Reclamation (Reclamation) Biological Assessment (BA) of your proposed action, the continuation of the Rio Grande Project Operating Agreement (Operating Agreement) with the Elephant Butte Irrigation District (EBID) and the El Paso County Water Improvement District No. 1 (EPCWID). The Operating Agreement is a written description of how Reclamation allocates Rio Grande Project water to EBID, EPCWID, and Mexico, consistent with the Rio Grande Compact. The proposed action also includes the storage of San Juan-Chama (SJ-C) Project water in Elephant Butte Reservoir (EBR) in southern New Mexico as part of the Rio Grande Project (Reclamation 2015).

Attached, below this memorandum, is the U.S. Fish and Wildlife Service (USFWS) Biological and Conference Opinion (Opinion) on the effects of the proposed action which includes continuation of the Operating Agreement and the proposed storage of SJ-C Project water in EBR. This Opinion addresses the effects of the proposed action on: 1) the endangered, Southwestern Willow Flycatcher (*Empidonax traillii extimus*) (flycatcher); 2) flycatcher critical habitat; 3) the threatened, western distinct population segment of the Yellow-billed Cuckoo (*Coccyzus americanus occidentalis*) (cuckoo); and, 4) cuckoo proposed critical habitat. Reclamation requested formal consultation under Section 7 of the Endangered Species Act (ESA) of 1973, as amended (16 U.S.C. 531 et seq.), on August 20, 2015, and subsequent analyses were provided to supplement the BA. On January 21, 2016, the Opinion was delivered, and coordination between the USFWS and Reclamation on incorporating subsequent comments

has transpired since that time. This revised Opinion will be considered final within a 30-day period.

Our Opinion is based upon the information submitted in your BA, meetings between the our staffs, and supplemental information provided, or other sources of information available to the USFWS, (such as technical reports, survey reports, publications, as cited below, and these are incorporated into this Opinion by their reference). An administrative record of this formal consultation is on file at the USFWS's New Mexico Ecological Services Field Office, at the address above.

Our Opinion relies on the revised regulations for critical habitat as described in 50 CFR Part 424 (81 FR 7413) to complete the following analysis with respect to critical habitat. This Opinion analyzes the effects of the proposed action and its relationship to the function and conservation role of flycatcher critical habitat and cuckoo proposed critical habitat to determine whether it may destroy or adversely modify these critical habitats.

Reclamation found that the proposed action, "may affect, but is not likely to adversely affect" Rio Grande Silvery Minnow (*Hybognathus amarus*) (silvery minnow) (Reclamation 2015). Reclamation's finding was based on their rationale that it was impossible to measure (or model) changes in EBR elevations due solely to the Operating Agreement from those changes in reservoir elevations influenced by climate change or associated with the storage of water for the Rio Grande Project, which is part of the environmental baseline (Reclamation 2015, section 5.3, *paraphrased*). That is, Reclamation (2015) found that effects of the Operating Agreement would not be able to be meaningfully measured, detected, or evaluated, given the environmental baseline, and therefore, Reclamation considered the effects of the Operating Agreement to be insignificant. Reclamation (2009, 2015) further anticipated that silvery minnows in the delta reach of EBR have the ability to move upstream (that is, they flee) towards lotic conditions (riverine habitat conditions) during periods of reservoir filling, and thus avoid the lentic conditions (lake habitat conditions, predators, and other factors) associated with a rising reservoir. Given the available information, the USFWS concurs with Reclamation's finding that the Operating Agreement, as described, may affect, but is not likely to adversely affect, silvery minnows that occupy the delta channel areas. However, the USFWS recommends Reclamation further model and quantify the relative proportions of changing EBR elevations on riverine habitat that is suitable for silvery minnows in the delta area. Should additional scientific information become available about any particular lentic condition, predators, or other factors, associated with a rising reservoir elevations that are attributable to the Operating Agreement, then Reclamation must re-assess its findings and reinitiate consultation, as appropriate (see Reinitation, below).

Consultation History

In 2008, Reclamation signed an Operating Agreement with EBID and EPCWID describing the general operating criteria and restrictions for EBR releases (Reclamation 2008). Through this Operating Agreement, Reclamation provides water to EBID which includes 90,640 acres in the Rincon and Mesilla valleys of New Mexico, and also to EPCWID which includes 69,010 acres in the Mesilla and El Paso valleys of Texas.

During 2009, Reclamation provided a BA (Reclamation 2009) and the USFWS provided a draft Opinion (USFWS 2009) and continued to coordinate on the effects analyses to listed species. On May 16, 2011, Reclamation (2011) withdrew its BA and ceased formal consultation with the USFWS. Since then, Reclamation has continued to monitor flycatchers and cuckoos at EBR, the development of riparian habitat within EBR, and modeled the effects of potential future hydrology in EBR based on climate change and Rio Grande Project water use patterns. Reclamation's model (BA) projects that during wet conditions, some flycatcher and cuckoo habitats in the reservoir pool would be inundated in the future, and thus, Reclamation has re-initiated formal consultation for the proposed action of storage of water in EBR associated with the Operating Agreement and for the storage of SJ-C Project water in EBR associated with the Rio Grande Project (Reclamation 2015).

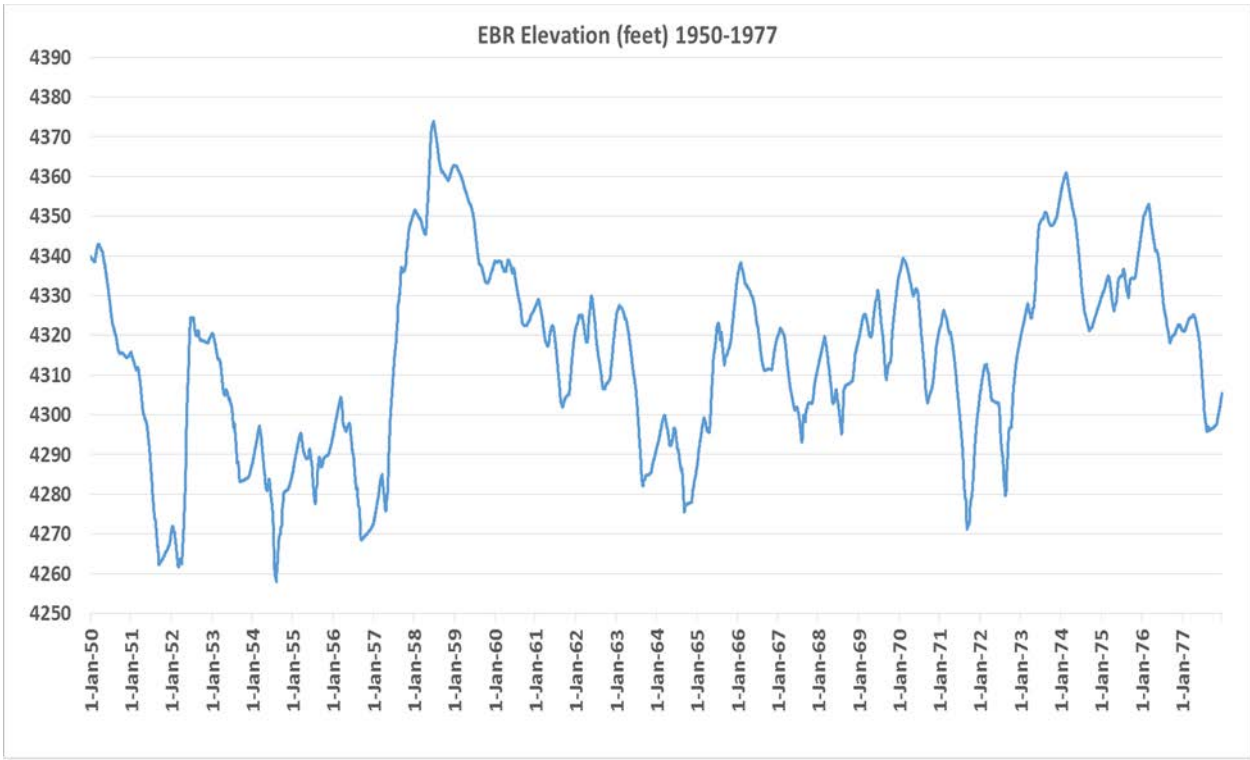
Attachment

BIOLOGICAL AND CONFERENCE OPINION

DESCRIPTION OF PROPOSED ACTION

The USFWS summarized the proposed action below, by summarizing the BA's relevant material as it pertains to this formal ESA consultation. Reclamation's BA (Reclamation 2015) is incorporated here by reference for additional detail on Reclamation's description of the proposed action.

As a result of the prolonged drought in the southwest, EBR has contained as little as 3 percent of its total water storage capacity in recent years (see webpage information of EBR elevations at http://www.waterdatafortexas.org/reservoirs/individual/elephant-butte.csv). As the water levels in EBR have receded, large areas of sediment have been exposed and riparian vegetation has become established, and flourished, in the previously inundated northern portion of the EBR (Figure 1).



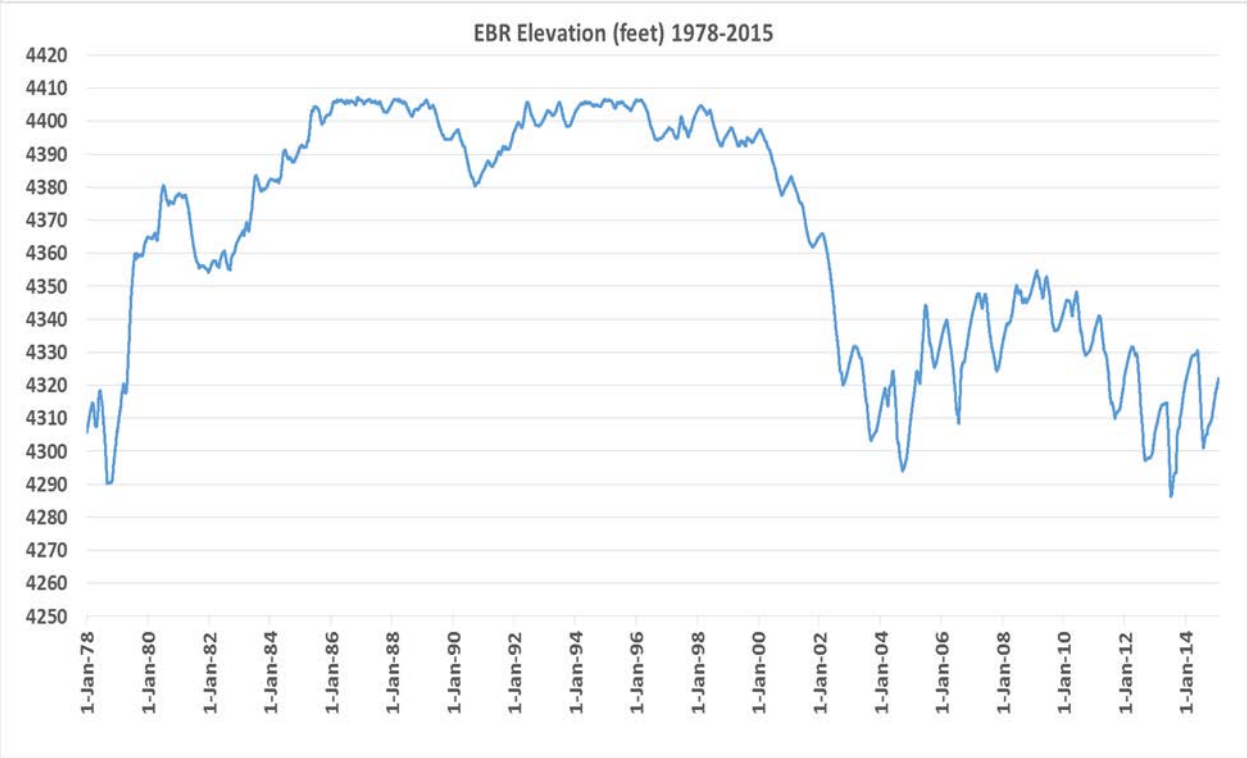


Figure 1. Historic EBR surface-water elevation, 1950-2015 (Reclamation 2015)
(Data source: http://www.usbr.gov/uc/elpaso/water/rgreports/faces/Reservoirs.jsp)

Some of this riparian habitat has proven to be suitable for breeding activities and nesting by flycatchers and cuckoos. During 2014 and 2015, the water levels of EBR increased and those water levels are now anticipated to increase in the future. When water levels in EBR rise, due in

part by the way in which the Rio Grande Project and the Operating Agreement are implemented by Reclamation, then flycatchers and cuckoos are directly and indirectly affected by the by increasing and decreasing water levels. Both the fluctuating water levels as well as areas around the water source inlets tend to create conditions for either the growth or destruction of riparian habitat conditions. However, since these riparian habitats are dynamic and can flourish, flycatcher and cuckoos may use them for breeding and nesting, and those areas of suitable habitat are likely to expand and contract over time based on the various conditions associated with the water's edge in the EBR and near the inlets.

Purpose and Objective

Reclamation's Rio Grande Project operational agreement is a tool for projecting and estimating the storage levels of water in EBR and Caballo Reservoir (downstream) and plan the delivery of irrigation water downstream in any one year. On an annual basis, Reclamation develops an operational plan considering the Operating Agreement, projected sources of water delivery from upstream, water surface elevations, estimates of evaporation, and timed releases of water from EBR and Caballo Reservoir are from Caballo Dam are coordinated and developed with a variety of federal, state, and local agencies (Reclamation 2015). Reclamation uses the Operating Agreement to help it comply with various irrigation water delivery contracts, the Rio Grande Compact, other agency requirements, and various court decrees and settlement agreements among Reclamation and affected parties (EBID and EPCWID).

Reclamation's 2015 BA (Reclamation 2015) evaluated and modeled the potential impacts of projected reservoir operations over a 35 year period (until December 31, 2050) and any associated fluctuating water levels to flycatchers and cuckoos in the action area (Reclamation 2015). The model only projects what may happen through 2050 and Reclamation anticipates updating the model within five years. Since all impacts to flycatchers and cuckoos in EBR are based on a model that shows distinct EBR filling and emptying cycles, the analysis considers a range of impacts that could occur through 2050. However, the specific timing, duration, and magnitude of impacts remain uncertain. Reclamation's current EBR water level and habitat elevation model does not project any adverse effects to flycatchers or cuckoos for the next five-to-seven years using three potential climate scenarios.

Over the past decade as EBR has receded, large areas of vegetation have become established, and flourished, in the wake of the reservoir pool. Some of this habitat has proven to be ideal for use by the flycatcher and cuckoo. The fluctuation of reservoir levels based on drought and precipitation events that alter the location and amount of suitable habitat available for both the flycatcher and cuckoo. When water levels rise, due to Rio Grande inflow, as well as in part due to the annual operations manual for EBR, then flycatcher and cuckoo habitats will change and those riparian habitat changes will be reflected by the abundance and distribution of flycatchers and cuckoos in EBR.

Reclamation described their discretionary measures in their 2013 Environmental Assessment (EA)(Reclamation 2013) and Technical Memorandum No. 86-68210-2015-05 (Appendix C Reclamation 2015) as:

- Pre-release of storage water from EBR for flood control purposes. When Reclamation, in

coordination with upstream river and reservoir management agencies, anticipates a large volume of flood waters above EBR to enter and exceed the top of the prudent flood space, Reclamation will pre-release an appropriate amount of water such that a temporary space in the reservoir is made available to be filled by the anticipated volume entering the reservoir. Therefore the final storage level at EBR doesn't exceed the top of the prudent flood space and flooding below Elephant Butte Dam and at Caballo Reservoir are controlled. Ultimately, whatever drawdown in the EBR storage level is accomplished by this pre-release operation is only temporary, because the storage level will rise again to the top of the prudent flood space.

- The carryover accounting in the Operating Agreement for the unused balance of annual diversion allocation to EBID and EPCWID. Under prior operating practices, annual diversion allocations were calculated based only on the estimated release of RGP water for the current year; the unused balance of each districts annual diversion allocation, if any, was implicitly relinquished at the end of each calendar year. Under the Operating Agreement, the unused balance of each district's annual diversion allocation, if any, is carried over and becomes part of the district's total diversion allocation the following year. The Operating Agreement specifies that carryover balance may be accumulated by either district up to 60% of each district's respective full annual allocation, or up to 305,918AF for EBID and 312,915AF for EPCWID; carryover balance in excess of this limit is transferred to the other district. The carryover provision is intended to encourage water conservation within the RGP by allowing each district to maintain its unused allocation balance up to a specified limit.
- The adjustment of annual diversion allocations to EBID and EPCWID to account for changes in annual RGP performance – i.e. changes in the amount of water actually available for diversion compared to the estimated available diversion based on the D-2 Curve. The Operating Agreement represents RGP performance using the diversion ratio, which is calculated as the ratio of total annual RGP allocation charges to total annual RGP release. The diversion ratio adjustment provision of the Operating Agreement allows for adjustment of the annual RGP allocations to EBID and EPCWID so as to maintain district diversion allocations to EPCWID at a level consistent with historical RGP performance as represented by the D-2 Curve. When the actual diversion ratio is greater than the D-2 Curve, EBID receives an increase in annual allocation compared to prior operating practices; when the diversion ratio is less than the D-2 Curve, EBID receives a decrease in allocation. The diversion ratio adjustment provision of the Operating Agreement therefore mitigates potential negative effects of changes in RGP performance, which result predominately from the actions of individual landowners within EBID, by ensuring that RGP allocations and deliveries to EPCWID remain consistent with historical RGP performance.
- Storage of SJC Project water in Elephant Butte Reservoir. In 1983, Reclamation and the Albuquerque-Bernalillo County Water Utility Authority (Authority) entered into a 25-year agreement (Contract No. 3-CS-53-01510) to allow the Authority to store up to 50,000 acre-feet of water in EBR. The amount accounted as non-RGP inflow to EBR is equal to the amount released from upstream minus agreed-upon transport losses for the conveyance of non-RGP water to the reservoir, unless that water was moved downstream for reasons that benefit Reclamation (such as to support riverine habitat for endangered species). The amount accounted as non- RGP water stored by the Authority is then

calculated as the Authority's previous non-RGP storage, plus non-RGP inflows, and minus evaporation of non-RGP water from storage.

Reclamation will meet with USFWS New Mexico Ecological Services Field Office annually and prior to the annual arrival of flycatchers and cuckoos to discuss the present year's RGP reservoirs operations and any anticipated impacts primarily to the flycatcher and cuckoo and their associated habitat, but also to the Rio Grande silvery minnow (minnow), and New Mexico Meadow Jumping Mouse (*Zapus hudsonius luteus*). In order to properly project EBR's water surface elevations for the coming year, Reclamation will utilize its RGP reservoir operational plan as a tool for projections of the EBR water surface elevations. In May each year, Reclamation presents its latest RGP reservoirs operational plan to the public in a series of public meetings held locally within the RGP area.

The conservation measures in Reclamation's 2015 BA (Reclamation 2015) include:

1. Continued modeling updates of hydrology and climatic conditions for the Operating Agreement.
2. Conducting fish community surveys, and flycatcher, cuckoo, and mouse habitat surveys following established protocols.
3. Continued monitoring of the channel morphology through the reservoir and upstream of the full pool of EBR (RM 62) to improve understanding of the river as the reservoir fluctuates in elevation.
4. Refining Frey and Kopp's potentially suitable habitat maps for the mouse.

Reclamation also proposed to update the Reclamation (2012) *Southwestern Willow Flycatcher Management Plan for the Rio Grande Project*, to include the cuckoo. Activities identified in the 2012 plan which would be continued include:

1. Conducting annual flycatcher and cuckoo presence/absence surveys in cooperation with IBWC.
2. Conducting mapping or vegetation inventories every two to three years until the vegetation is stabilized and mature to determine areas having higher suitability as flycatcher and cuckoo habitat.
3. Maintenance of the recovery plan goals for the target number of flycatcher territories in both the MRG and Lower Rio Grande Management Units.
4. Assess opportunities to expand restoration efforts to benefit flycatcher and cuckoo habitat (and for other ESA listed species).
5. Explore opportunities to reestablish younger age classes of native vegetation, focusing on Goodding's willow (*Salix gooddingii*).

Reclamation's Hydrologic Model

Reclamation's Technical Memorandum No. 86-68210-2015-05 (Appendix C Reclamation 2015) projects and estimates the storage levels of EBR. Modeling software was selected and configured to simulate RGP operations and hydrology, including surface-water and groundwater conditions, in the Rincon and Mesilla Basins under each of the alternative operating procedures proposed for Reclamation's 2013 EA (Reclamation 2013). These alternatives include:

• No Action (Implement operating practices as defined in the 2008 Operating Agreement – including new diversion ratio adjustment, new carryover accounting provision, and the storage of SJ-C Project water in EBR)
• No Action without SJ-C Project Storage
• No Action without Carryover Provision
• No Action without Diversion Ratio Adjustment
• Prior Operating Practices (No diversion ratio adjustment, no carryover accounting provision of the 2008 Operating Agreement, but continue to store SJ-C Project water in EBR)

For each alternative, simulations were carried out under a range of projected future climate conditions. Model results were post-processed and compiled to facilitate comparison of RGP operations and surface-water and groundwater resources under the No Action Alternative to conditions under each action alternative. Parameters provided by the model output and post-processing analysis include:

• RGP storage, non-RGP storage, and total storage in Elephant Butte and Caballo Reservoirs;
• Water surface elevation and area of EBR;
• Reservoir releases from Caballo Dam;
• Diversion of RGP surface-water to EBID, EPCWID, and Mexico;
• Delivery of RGP surface-water to irrigated lands within EBID and to irrigated lands in the Mesilla Valley portion of EPCWID;
• Groundwater pumping for irrigation of groundwater-only irrigated lands in New Mexico and for supplemental irrigation of irrigated lands within EBID and irrigated lands in the Mesilla Valley portion of EPCWID;
• Changes in groundwater storage and water table elevations in Rincon and Mesilla Valleys.

For additional details pertaining to model results, please see Technical Memorandum No. 86-68210-2015-05 (Appendix C Reclamation 2015), Reclamation's section 2.2 Projected Water Surface Elevation in the RGP BA (Reclamation 2015), and Reclamation's 2013 EA (Reclamation 2013). The water surface elevation for EBR output provided by this model was used to extrapolate effects on listed species.

Action Area

The Operating Agreement and SJ-C storage associated with the RGP was established for the EBR in Sierra and Socorro Counties, New Mexico. This consultation covers the action area as defined by Reclamation as "…to only cover that area with potential effects to federally listed or proposed species, which is EBR from full pool to dead pool" (Reclamation 2015b). Reclamation's action area equates to the action area used in this Opinion. The RGP continues farther south along the Rio Grande and into Texas, however, Reclamation has determined there are "no effects" associated with the proposed action, the 2008 Operating Agreement, past the defined action area.

The action area is thus considered EBR from full pool to dead pool. The Operating Agreement proposed action within Reclamation's discretion (new diversion ratio adjustment, new carryover accounting provision, and the storage of SJ-C Project water in EBR), would all be associated with EBR from full pool to dead pool. As indicated in Reclamation's BA (Reclamation 2015),

"Caballo Reservoir water levels are highly managed and rarely are these [flycatcher or cuckoo occupied] sites flooded by more than a foot or two of reservoir water. The river below Caballo Reservoir is projected to have released within the range of historical operations under the proposed action."

STATUS OF THE SPECIES

SOUTHWESTERN WILLOW FLYCATCHER (FLYCATCHER)

Throughout this document the terms territory and site are used to help describe flycatcher population biology. A territory is the area occupied or defended by a single male or pair of flycatchers throughout the breeding season. Territories are the unit of measurement used by the USFWS in determining population status and trends. Flycatchers tend to cluster their territories. A flycatcher site may include a single territory or a cluster of territories. Migratory habitat is described for flycatcher long-distance migration and stopover habitat. The term 'suitable or moderately suitable habitat' refers to a patch of habitat with the adequate structure, density, and vegetation composition to accommodate flycatcher breeding, nesting, egg and fledgling rearing activity.

Species and Habitat Description

The flycatcher is a small grayish-green passerine bird (Family Tyrannidae) measuring approximately 5.75 inches in length. It has a grayish-green back and wings, whitish throat, light gray-olive breast, and pale yellowish belly. Two white wingbars are visible (juveniles have buffy wingbars). The eye ring is faint or absent. The upper mandible is dark, and the lower is light yellow grading to black at the tip. The song is a sneezy "fitz-bew" and the call is a repeated "whitt" (Sogge *et al.* 2010).

The flycatcher is one of four currently recognized willow flycatcher subspecies (Unitt 1987, Browning 1993; Paxton 2000; Paxton et al. 2008). It is a neotropical migrant that breeds in the southwestern U.S. and migrates to Central and South America during the non-breeding season (USFWS 2002). The historic breeding range of the flycatcher included southern California, Arizona, New Mexico, western Texas, southwestern Colorado, southern Utah, extreme southern Nevada, and extreme northwestern Mexico (Sonora and Baja) (Unitt 1987, Browning 1993, Paxton 2008, Sogge 2010).

The flycatcher breeds in dense riparian vegetation from sea level in California to approximately 8,500 feet in Arizona and southwestern Colorado. Flycatchers primarily nest in dense riparian patches of vegetation composed of Goodding's willow, coyote willow (*Salix exigua*), Geyer's willow (*Salix geyeriana*), arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), yewleaf willow (*Salix taxifolia*), boxelder (*Acer negundo*), tamarisk (also known as saltcedar, *Tamarix ramosissima*), and Russian olive (*Elaeagnus angustifolia*). While there are exceptions, generally flycatchers are not found nesting in areas without willows, tamarisk, or both (78 FR 343). Nesting activity typically begins in early June along the Middle Rio Grande (Moore and Ahlers 2015). Nests typically contain between three and four eggs (Sogge *et al.* 2010). Flycatchers

have a higher site fidelity than nest fidelity and can move among breeding sites within and between drainages (Kenwood and Paxton 2001). Flycatchers will typically colonize in a large population (metapopulation) and disperse within 18-25 miles to form smaller populations (Paxton 2007, 76 FR 50542)

Saltcedar is an important component of nesting and foraging habitat in throughout the species range. For example, during 2014 and along the Middle Rio Grande, 162 of the 257 (63 percent) known flycatcher nests (in 364 territories) were in saltcedar (Moore and Ahlers 2015). Three habitat types have been described for the flycatcher including: native broadleaf, monotypic exotic, and mixed native/exotic (Sogge *et al.* 2010).

Flycatcher suitable habitat is dynamic and can change rapidly; historically occupied sites can mature beyond suitable habitat for nesting, suitable saltcedar or willow habitat can develop in three to five years, heavy runoff can reduce/remove suitable habitat in a day, or river characteristics may change (McLeod *et al.* 2005, Siegle et al. 2013). Flycatcher use of riparian vegetation in different successional stages may also be dynamic. For example, over-mature or young riparian vegetation not suitable for nest placement can be occupied and used for foraging and shelter by migrating, breeding, dispersing, or non-territorial individuals (McLeod *et al.* 2005). That same habitat may subsequently grow or cycle into habitat used for nest placement. Flycatcher habitat can quickly change and vary in suitability, location, use, and occupancy over time (Finch and Stoleson 2000).

Listing and Critical Habitat

The final rule listing the flycatcher as endangered was published on February 27, 1995 and designation of critical habitat was deferred (60 FR 10694). Flycatcher critical habitat was designated on July 22, 1997 in the Federal Register (62 FR 39129). In May 2001, citing a faulty economic analysis, the 10th Circuit Court of Appeals vacated the designation of critical habitat and instructed the USFWS to issue a new flycatcher critical habitat designation. On October 19, 2005, the USFWS again designated critical habitat for the flycatcher in approximately 120,824 acres or 737 miles within Arizona, California, Nevada, New Mexico and Utah. On July 13, 2010, the USFWS agreed to revise critical habitat for the flycatcher; while the 2005 critical habitat designation remained in place.

A proposal for the designation of flycatcher critical habitat was published in the Federal Register on October 12, 2004 (69 FR 60706), with a final rule published October 19, 2005 (70 FR 60886). A total of 737 river miles in southern California, Arizona, New Mexico, southern Nevada, and southern Utah were included in the final designation. The lateral extent of critical habitat included areas within the 100-year floodplain. At the time, the EBR pool as well as the majority of nesting birds near San Marcial, were just outside of the critical habitat boundary.

As a result of a suit filed by the Center for Biological Diversity over the critical habitat designation in 2005, a revision for critical habitat was proposed on August 15, 2011 (76 FR 50542). The final rule published January 3, 2013 (78 FR 343). The new designation includes a total of 1,227 river miles within the same states listed in the 2005 designation. The critical habitat designation for the Middle Rio Grande Management Unit now extends farther south, when compared to the 2005 designation, to the Socorro/Sierra County line (or river mile 54) and

within a portion of the EBR pool. The primary constituent elements (PCEs) of critical habitat include riparian plant species in a successional riverine environment (for nesting, foraging, migration, dispersal, and shelter), specific structure of this vegetation, and insect populations for food. A variety of river features such as broad floodplains, water, saturated soil, hydrologic regimes, elevated groundwater, fine sediments, etc. help develop and maintain these PCEs (78 FR 343).

Primary Constituent Elements of Critical Habitat

The PCEs listed in the 2013 final rule for the flycatcher are:

(1) *Riparian vegetation.* Riparian habitat along a dynamic river or lakeside, in a natural or manmade successional environment (for nesting, foraging, migration, dispersal, and shelter) that is comprised of trees and shrubs (that can include Goodding's willow, coyote willow, Geyers willow, arroyo willow, red willow, yewleaf willow, pacific willow (*S. lasiandra*), boxelder, tamarisk, Russian olive, buttonbush (*Cephalanthus occidentalis*), cottonwood (*Populus fremontii*), stinging nettle (*Urtica dioica*), alder (*Alnus rhombifolia, A. oblongifolia, A. tenuifolia*), velvet ash (*Fraxinus velutina*), poison hemlock (*Conium maculatum*), blackberry (*Rubus ursinus*), seep willow (*Baccharis salicifolia, B. glutinosa*), oak (*Quercus agrifolia, Q. chrysolepis*), rose (*Rosa californica, R. arizonica, R. multiflora*), sycamore (*Platinus wrightii*), false indigo (*Amorpha californica*), Pacific poison ivy (*Toxicodendron diversilobum*), grape (*Vitis arizonica*), Virginia creeper (*Parthenocissus quinquefolia*), Siberian elm (*Ulmus pumila*), and walnut (*Juglans hindsii*)) and some combination of:

(a) Dense riparian vegetation with thickets of trees and shrubs that can range in height from about 2 to 30 meters (about 6 to 98 feet). Lower-stature thickets (2 to 4 meters or 6 to 13 feet tall) are found at higher elevation riparian forests and tall-stature thickets are found at middle and lower-elevation riparian forests;

(b) Areas of dense riparian foliage at least from the ground level up to approximately 4 meters (13 feet) above ground or dense foliage only at the shrub or tree level as a low, dense canopy;

(c) Sites for nesting that contain a dense (about 50 percent to 100 percent) tree or shrub (or both) canopy (the amount of cover provided by tree and shrub branches measured from the ground);

(d) Dense patches of riparian forests that are interspersed with small openings of open water or marsh or areas with shorter and sparser vegetation that creates a variety of habitat that is not uniformly dense. Patch size may be as small as 0.1 hectare (0.25 acre) or as large as 70 hectares (175 acres).

(2) *Insect prey populations.* A variety of insect prey populations found within or adjacent to riparian floodplains or moist environments, which can include: flying ants, wasps, and bees (Hymenoptera); dragonflies (Odonata); flies (Diptera); true bugs (Hemiptera); beetles (Coleoptera); butterflies, moths, and caterpillars (Lepidoptera); and spittlebugs (Homoptera).

It is important to recognize that the PCEs, (PCE 1a and 2), are present throughout the river segments selected, but the specific quality of riparian habitat for nesting (PCE 1b, 1c, 1d, 1e), migration (PCE 1), foraging (PCE 1 and 2), and shelter (PCE 1) will not remain constant in their condition or location over time due to succession (i.e., plant germination and growth) and the dynamic environment in which they exist (78 FR 343).

In our effects analysis for critical habitat (i.e., the determination whether a proposed action, destroys or adversely modifies critical habitat) the USFWS evaluates whether the potential loss, when added to the environmental baseline, is likely to appreciably diminish the capability of the critical habitat to satisfy essential requirements of the flycatcher. In other words, activities that may destroy or adversely modify critical habitat include those that alter the PCEs (defined above) to an extent that the value of the critical habitat for both the survival and recovery of the flycatcher is appreciably reduced (50 CFR 402.02).

Flycatcher Recovery

The USFWS published a final flycatcher Recovery Plan in 2002 (USFWS 2002). The Recovery Plan (USFWS 2002) identified several key strategies tied to flycatcher conservation such as: (1) populations should be distributed close enough to each other to allow for movement; (2) maintaining/augmenting existing populations is a greater priority than establishing new populations; and (3) a population's increase improves the potential to disperse and colonize. Breeding habitat objectives are incorporated into the delisting criteria because of the importance of providing replacement habitat for dispersing flycatchers after natural stochastic destruction of existing breeding habitat, and suitable habitat for future population growth. Essential to the survival and recovery of the flycatcher is a minimum size, distribution and spatial proximity of habitat patches that promotes metapopulation stability. The current size of occupied breeding habitat patches is skewed heavily toward small patches and small population sizes; this situation inhibits recovery. Recovery will be enhanced by increasing the number of larger populations and by having populations distributed close enough to increase the probability of successful immigration by dispersing flycatchers. The Recovery Plan further describes the reasons for endangerment, current status of the flycatcher, addresses important recovery actions, includes detailed issue papers on management issues, and identifies the goals for recovery.

Flycatcher recovery is defined by reaching numerical and habitat related goals for each specific management unit established throughout the subspecies range and establishing long-term conservation plans (USFWS 2002). Because the breeding range of the flycatcher encompasses a broad geographic area with much site variation, management of its recovery is approached in the Recovery Plan by dividing the flycatcher's range into six Recovery Units, each of which are further subdivided into Management Units (USFWS 2002). This provides an organizational strategy to "characterize flycatcher populations, structure recovery goals, and facilitate effective recovery actions that should closely parallel the physical, biological, and logistical realities on the ground" (USFWS 2002). Recovery goals are recommended for most Management Units. Recovery Units are defined based on large watershed and hydrologic units.

Within each Recovery Unit, Management Units are based on watershed or major drainage boundaries at the Hydrologic Unit Code Cataloging Unit level. Flycatcher habitat within Recovery and Management Units is expected to expand, contract, or change as a result of flooding, drought, inundation, and changes in floodplains and river channels (USFWS 2002) that result from natural occurrences and water or land management choices. The Recovery Plan (USFWS 2002) provides recommendations to recover the flycatcher and provides two alternatives, either of which can be met, in order to consider downlisting the species to threatened status. The proposed action will occur in the Middle Rio Grande Management Unit of

the Rio Grande Recovery Unit for the flycatcher (USFWS 2011). The Recovery Plan identified a goal of 100 flycatcher territories in the Middle Rio Grande Management Unit to contribute towards recovery.

Rangewide Distribution and Abundance of Flycatchers

There are currently 288 known flycatcher breeding sites in California, Nevada, Arizona, Utah, New Mexico, and Colorado (all sites where a resident flycatcher has been detected as of the 2007 breeding season) holding an estimated 1,299 territories (Durst *et al*. 2008) (table 1). Currently, rangewide population stability is believed to be largely dependent on the presence of large populations in the Gila River, Rio Grande, and San Pedro River drainages where approximately 60 percent of the 1,299 territories exist as of the breeding season of 2007. Therefore, the result of catastrophic events or losses of significant populations either in size or location could greatly change the status and survival of the species. Conversely, expansion into new habitats or discovery of other populations will improve the known stability and status of the flycatcher.

Since listing in 1995, at least 155 Federal agency actions have undergone (or are currently under) formal section 7 consultation to address effects to the species. Many activities continue to adversely affect the distribution and extent of all stages of flycatcher habitat throughout its range (development, urbanization, grazing, recreation, native and non-native habitat removal, dam operations, river crossings, ground and surface water extraction, etc.). Stochastic events also continue to change the distribution, quality, and extent of flycatcher suitable habitat.

Table 1. Number of Southwestern willow flycatcher breeding sites and territories by state, as of 2007. (There is no recent survey data or other records to know the current status and distribution within the state of Texas.) (Durst *et al.* 2008).

State	Number of sites with WIFL territories As of 2007	Percentage of sites with WIFL territories as of 2007	Number of territories as of 2007	Percentage of total territories as of 2007
Arizona	124	43.1 %	459	35.3 %
California	96	33.3 %	172	13.2 %
Colorado	11	3.8 %	66	5.1 %
Nevada	13	4.5 %	76	5.9 %
New Mexico	41	14.2 %	519	40.0 %
Utah	3	1.0 %	7	0.5%
Total	288	100 %	1299	100 %

Distribution and Abundance in New Mexico and the Action Area

Unitt (1987) considered New Mexico as the state with the greatest number of flycatchers remaining. After reviewing the historic status of the flycatcher and its riparian habitat in New Mexico, Hubbard (1987) concluded, "[it] is virtually inescapable that a decrease has occurred in the population of breeding flycatchers in New Mexico over historic time. This is based on the fact that wooded sloughs and similar habitats have been widely eliminated along streams in New Mexico, largely as a result of the activities of man in the area." Unitt (1987), Hubbard (1987), and more recent survey efforts have documented very small numbers and/or extirpation in New Mexico on the San Juan River (San Juan County), near Zuni (McKinley County), Blue Water Creek (Cibola County), and the Rio Grande (Doña Ana County and Socorro County). In New Mexico, surveys and monitoring in 2007 documented approximately 514 flycatcher territories and 403 nests (USFWS and U.S. Bureau of Reclamation preliminary data). During the 2003 survey season two new sites were detected in New Mexico, both were in the upper reaches of the Canadian River drainage, one in Colfax County and one in Mora County. Two more new sites were detected during the 2005 survey season, one in Mora County and one near the Mimbres River in Grant County. In 2007 a new site was found on the San Francisco River in Catron County. In 2008 a new nesting site was found on the Black River in Eddy County. Flycatchers have been observed at a total of 42 sites in New Mexico along the Rio Grande, Chama, Canadian, Gila, San Francisco, San Juan, Pecos, and Zuni drainages.

Approximately 364 flycatcher territories were found within the Middle Rio Grande Basin of New Mexico during the 2014 breeding season (Moore and Ahlers 2015). Of the 364 territories, 307 were located in the San Marcial Reach (which encompasses the action area plus an additional 6.5 miles) (Figure 2). Surveyed sites were scattered from just north of Cochiti Reservoir downstream to EBR. During the 2014 breeding season, most suitable habitat was surveyed within the mainstem of the Rio Grande in New Mexico. It is highly unlikely that any large populations of flycatchers have gone undetected, however, sites supporting a few undetected territories may exist in some isolated patches of habitat throughout the Rio Grande Basin.

2014 Estimated Territories for the Middle Rio Grande Basin:

- Frijoles Reach – 0 territories
- Belen Reach – 18 territories
- Sevilleta/La Joya Reach – 4 territories
- Escondida Reach – 4 territories
- San Acacia Reach – 0 territories
- Bosque del Apache NWR (active floodplain only) – 23 territories
- Tiffany – 8 territories
- San Marcial – 307 territories

Figure 2. General locations of 2014 survey sites. 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. (Moore and Ahlers 2015)

The Figure 3, below, displays how territories have fluctuated in the Middle Rio Grande since 1999 (Moore and Ahlers 2015).

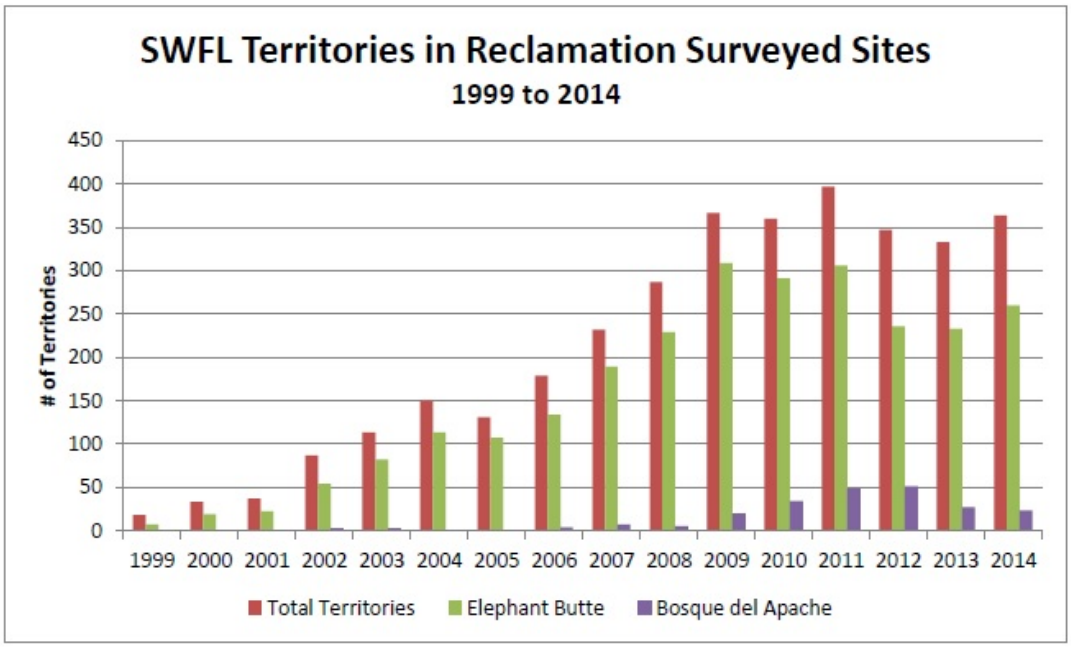


Figure 3. Flycatcher territories (SWFL) in Reclamation surveyed areas from 1999 to 2014. (Moore and Ahlers 2015)

WESTERN YELLOW-BILLED CUCKOO (CUCKOO)

Throughout this document the terms territory and site are used to help describe cuckoo population biology. A territory is the area occupied by a pair or a pair accompanied by an additional 'helper male' or juvenile male cuckoo throughout the breeding season. Territories are the unit of measurement used by the USFWS in determining population status and trends. Detections consist of individual locations where a cuckoo was identified either by aural or visual observation either during migration or during the breeding period. Such information may not signify a breeding territory, but rather a location used for foraging, resting, or perhaps, breeding activities (Carstensen *et al.* 2015). Cuckoo territories may overlap and are not typically defended. The term 'suitable or moderately suitable habitat' refers to habitat patches where cuckoos would be suspected to potentially use as a breeding or nesting area. The 'suitable or moderately suitable habitat' would typically be at least 12 acres (Halterman *et al.* 2015) in area and surrounded by large expanses of vegetation, at least 127 acres using telemetry results gathered in the Middle Rio Grande from 2007-2008 (Sechrist *et al*. 2009) for foraging that may be of lower quality (monotypic stands of saltcedar, for example).

Species and Habitat Description

The cuckoo is a medium sized bird (Family Cuculidea) measuring approximately 12 inches in length and weighing about 60 grams. The plumage consists of a grayish-brown back and white chest, the tail is black and quite long with white spots. The upper mandible is dark, and the

lower is typically yellow with a black tip. Cuckoos are fairly secretive in nature and call infrequently with "kowlp", "coo", "kuk" or "knocking" vocalizations.

The "threatened" status western yellow-billed cuckoo is considered a "distinct population segment" of the yellow-billed cuckoo as opposed to a sub-species. Cuckoos are Neotropical migrant birds that winter in South America east of the Andes, primarily south of the Amazon Basin in southern Brazil, Paraguay, Uruguay, eastern Bolivia, and northern Argentina (78 FR 61621). The historic breeding range of the cuckoo included riparian systems in western North America from southern British Columbia to northwestern Mexico (Hughes 1999). The cuckoo is now considered extirpated over much of the western range, including British Columbia, Oregon, and Washington (Hughes 1999).

Breeding cuckoos are riparian obligates and nest in low to moderate elevation riparian woodlands with dense vegetation providing a thick canopy cover. Cuckoos primarily use willow species such as Goodding's willow for nesting and have open saucer type nests (similar to that of a Dove). Nests are built from 4 to 73 feet above the ground, and nest trees range from 10 to 98 feet in height (79 FR 48547). Territories are typically 200 acres or more (79 FR 48547). Nesting activity typically occurs between late June and late July and nest clutch size is typically between two and four eggs (Halterman *et al.* 2015). There is more to learn about cuckoo site fidelity, but where banding studies have taken place, returning cuckoos one or more years after initial capture were typically recaptured within 80 feet to 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).

Exotic vegetation, and particularly saltcedar, does not appear to be the preference by cuckoos, but will be utilized if available. From 2009-2014 along the Middle Rio Grande, nearly 40% of the cuckoo detections were located in areas with canopy, understory or both dominated by 75% or more exotic species cover (Carstensen *et al.* 2015). Telemetry data was gathered along the Middle Rio Grande from 2007-2008 and used Kernel Home Range, a density estimation tool, for post processing the field data to determine cuckoo habitat use. These data indicate that approximately 33% of the habitat utilization within the 50% probability Kernel Home Range data (estimated to be the core use area) includes either canopy, understory or both that is dominated by exotic species foliage cover (Sechrist *et al*. 2009). However, in Arizona on the lower Colorado River, the odds of cuckoo occurrence decreased rapidly as saltcedar presence increased (Johnson *et al.* 2012).

Similar to that of the flycatcher, cuckoo habitat is dynamic and can change rapidly. Nesting habitat can mature as quickly as 2-3 years depending on conditions and vegetative species (Halterman *et al.* 2015). Cuckoos have a certain degree of site fidelity, but additional research is warranted in this topic as their localized populations tend to fluctuate throughout the range.

Listing and Critical Habitat

The final rule listing the cuckoo as threatened was published on October 3, 2014 (79 FR 59991). On August 15, 2014, a proposal for cuckoo critical habitat designation was made that would include approximately 546,335 acres of riparian habitat in Arizona, California,

Colorado, Idaho, Nevada, New Mexico, Texas, Utah, and Wyoming (79 FR 48547). The proposal for critical habitat does include the northernmost 8 miles of EBR (from river mile 62 to 54) (79 FR 48547).

The primary constituent elements (PCEs) of cuckoo proposed critical habitat are those elements of the physical or biological features in an area that provide for life-history processes and are essential to the conservation of the cuckoo. Examples of life-history processes would include cuckoo breeding, foraging and dispersing (79 FR 48547).

Primary Constituent Elements of Critical Habitat

The PCEs listed in the 2014 proposed rule for the cuckoo are:

(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 325 feet (100 meters) in width and 200 acres (81 hectares) 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.

Similar to the PCEs for flycatcher, it is important to recognize that in order to support or provide for dynamic riverine processes, that riparian habitats must be dynamic, with natural processes that create, recycle, and maintain riparian habitat. Riparian habitat can quickly change and vary in suitability, location, use, and occupancy by cuckoo over time (79 FR 48547). For example, suitable habitat can develop quickly, heavy runoff can create velocities or deposit sediment that may reduce or remove habitat within in a day, or river flow and channel topology may also change quickly variously favoring or discouraging various riparian habitat conditions (USFWS 2002). These and other factors can destroy or degrade breeding habitat, such that one cannot expect any given breeding habitat to remain suitable in perpetuity (USFWS 2002). Thus, in order to manage breeding habitat over time, it is necessary to have additional suitable habitat available to which flycatchers, displaced by such habitat loss or change, can readily move into and breed (USFWS 2002). If a short term loss of habitat were to never occur, habitat would simply overmature and no longer have the structure and foliage cover to accommodate nesting activity.

Rangewide Distribution and Abundance
Limited information is currently available regarding the distribution and abundance of cuckoos rangewide. The estimated cuckoo population was summarized by the USFWS (78 FR 61621) and is provided in Table 2, below:

Table 2. 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

As evidenced by Table 2, Northwestern Mexico and Arizona are believed to have the largest populations of cuckoos, rangewide. New Mexico also contains important breeding habitat for cuckoos, as approximately 15 percent of the estimated population was detected there. Similar to the flycatcher, many activities (such as development, urbanization, grazing, recreation, native and non-native habitat removal, dam operations, river crossings, ground and surface water extraction, etc.) can adversely affect the distribution and extent of cuckoos throughout its range. Catastrophic events or losses of significant populations either in size or location could greatly change the status and survival of the species. Conversely, expansion into new habitats or discovery of other populations will improve the known stability and status of the cuckoo.

Distribution and Abundance in New Mexico and the Action Area
Cuckoos were historically found in New Mexico in riparian areas along the Rio Grande, as well as the Gila, San Francisco and San Juan Rivers (78 FR 61621). In 1984, 315 pairs were estimated for New Mexico (Howe 1986).

Systematic surveys have not been completed for the Gila, San Francisco and San Juan Rivers. Based on currently available habitat in those areas, a maximum estimate of 55 territories would be possible (78 FR 61621). Reclamation has completed formal surveys along the Rio Grande starting in 2006 with varying survey extent and results. In years where data is directly comparable (2009-2014 from the South Boundary of Isleta Pueblo to EBR), the population has

ranged from a low of 73 territories in 2011 to a high of 121 territories in 2012 (Carstensen *et al.* 2015).

Approximately 91 cuckoo territories were found within the Middle Rio Grande Basin of New Mexico during the 2014 breeding season (Carstensen et al. 2015). Of the 91 territories, 49 were located in the historic reservoir pool of Elephant Butte. Surveyed sites were scattered from Belen downstream to EBR. During the 2014 breeding season, most suitable habitat was surveyed within the mainstem of the Rio Grande in New Mexico.

2014 Estimated Territories for the Middle Rio Grande Basin:

- Belen Reach – 5 territories
- Sevilleta/La Joya Reach – 2 territories
- Escondida Reach – 7 territories
- San Acacia Reach – 4 territories
- Bosque del Apache NWR (active floodplain) – 12 territories
- Tiffany – 0 territories
- San Marcial – 61 territories

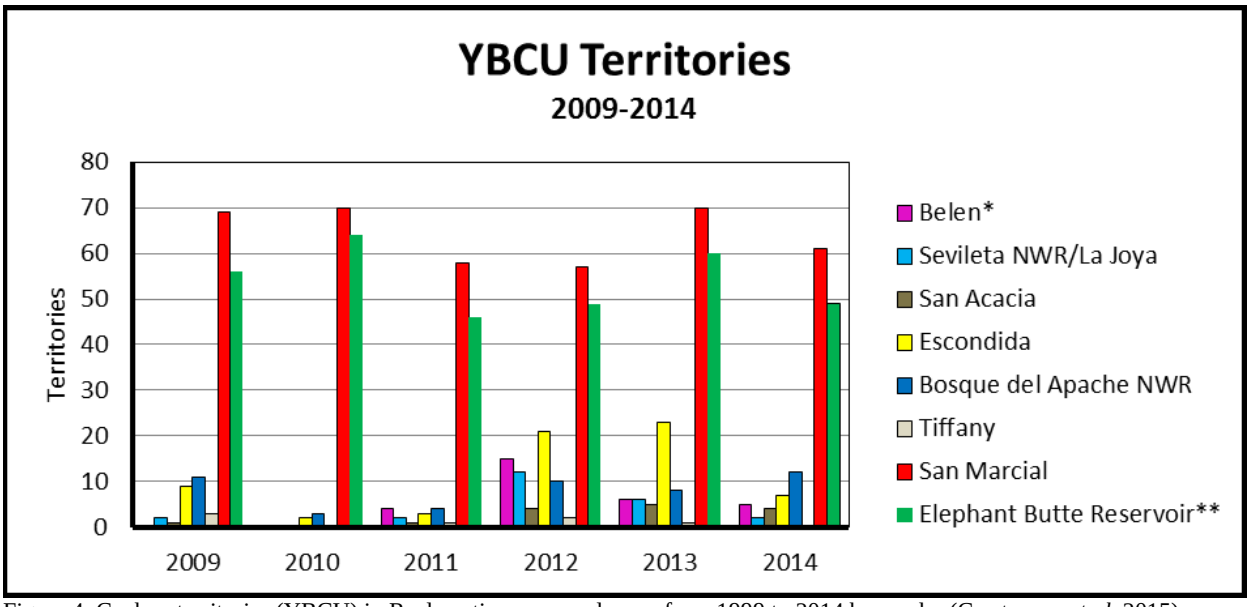


Figure 4. Cuckoo territories (YBCU) in Reclamation surveyed areas from 1999 to 2014 by reach. (Carstensen *et al.* 2015)
*Additional survey area was added in 2014. **Elephant Butte Reservoir is a subset of the San Marcial Reach.

ENVIRONMENTAL BASELINE

FLYCATCHER

Habitat Characteristics

Development of a flycatcher habitat suitability model was initiated in 1998 for the Middle Rio Grande Basin and continues to be refined based on changes in hydrology and updated vegetation

maps. Riparian vegetation in the Middle Rio Grande Basin between San Acacia Diversion Dam and Elephant Butte Reservoir has historically been classified using the Hink and Ohmart classification system (Hink and Ohmart 1984). This system identifies vegetation polygons based on dominant species and structure. Plant community types are classified according to the dominant or codominant plant species in the canopy and shrub layers. During the summer and fall of 2002, as part of the ESA Collaborative Program, Reclamation personnel updated vegetation maps from Belen to San Marcial using a combination of ground truthing and aerial photo analysis (Callahan and White 2004). During the summer of 2004, the conservation pool of Elephant Butte Reservoir was again aerially photographed (true color) and vegetation heights were remotely-sensed using Light Detection and Ranging (LiDAR) methods (Reclamation ArcGIS Shapefile 2006). The area was ground truthed again during the summer of 2005. These data were updated from Highway 380 to EBR in 2008 (Ahlers *et al.* 2010), and again from Belen to EBR in 2012 which is the most recent ground truthed mapping effort currently available (Siegle *et al.* 2013).

Riparian habitat within the Middle Rio Grande include dense stands of willows and cottonwoods adjacent to or near the river channel, or the Low Flow Conveyance Channel (LFCC) Outfall in the case of the historically flooded and now dry portion of EBR (Siegle *et al.* 2013). The area from Cochiti Reservoir to Albuquerque in the Middle Rio Grande support local areas of suitable flycatcher habitat; however, very few if any birds have been documented establishing territories in this area (NM statewide flycatcher presence/absence survey database). The Isleta and San Acacia Reaches also contain dense stands of saltcedar (Siegle *et al.* 2013). Flycatchers (and many other species of neotropical migrant landbirds) use the Middle Rio Grande riparian corridor as stop-over habitat during migration. Studies have shown that during the spring and fall migration, flycatchers are more commonly found in willow habitats than in other riparian vegetation types, including the narrow band of coyote willows that line the LFCC (Finch *et al.* 1998). During migration, flycatchers use a greater variety and distribution of habitats, including non-riparian vegetation than during breeding (Finch et al. 2000). Stopover habitats may lack some of the components important for breeding birds such as the presence of standing water or moist soils and suitable riparian patch size and structure. However, Yong and Finch (1997) and Finch et al. (2000) reported that capture rates and body mass of flycatchers were often highest in flycatchers captured in willow than in cottonwood, tamarisk, agricultural edge, or mowed willow. Recent presence/absence surveys during May have detected migrating flycatchers throughout the Rio Grande riparian corridor in vegetation types that are classified as "low suitability" for breeding habitat (Siegle *et al.* 2013).

Habitat Availability within EBR

Vegetation within the reach was mapped most recently using the Hink and Ohmart classification system by Reclamation (Siegle *et al.* 2013). Breeding habitat suitability was categorized as:

Suitable—Suitable habitat included vegetation in which a high percentage of flycatcher territories were detected from 2006 to 2009. Areas with a significant structural component - primarily community types 3 (intermediate sized canopy with understory), 4 (intermediate sized canopy with little to no understory), and 5 (understory 5-15 feet with little to no canopy) – were also considered suitable if a high percentage of territories occurred within the vegetation type. Other qualifying vegetation types were those that included a combination of important plant

species, especially tree willow, coyote willow (particularly in the canopy layer), Russian olive, and saltcedar (however not monotypic saltcedar) and also vegetation classes with a "d" qualifier, which indicated > 50 percent aerial vegetation cover in either the canopy, understory, or both.

Moderately Suitable—Moderately suitable habitat included vegetation in which a fairly high percentage of territories occurred from 2006 to 2009. Areas that provided a good structural component (primarily community types 3, 4, and 5 and occasionally community type 1 (mature/tall canopy with understory)) could also be considered moderately suitable. This category required an adequate combination of vegetation species with at least 50 percent of the species composition made up of the more desirable plant species (those listed under "Suitable" habitat).

Unsuitable—Unsuitable habitat included vegetation in community types 2 (mature/tall canopy with little to no canopy), 6 (young understory) and frequently in community type 1. These were habitats in which vegetation was either too sparse or too mature or the majority of the polygon consisted of the lower priority plant species. If four-wing saltbush, honey or screwbean mesquite, creosote, or New Mexico olive was a component of the classification, then the vegetation type was determined to be unsuitable.

Currently, USFWS groups the first two categories (suitable and moderately suitable, listed above) as equally suitable nesting and breeding habitat for the flycatcher, because a large number of nesting sites are currently found in both categories of habitat. At this time, the USFWS does not have sufficient information to categorize suitable habitats that contain non-native riparian vegetation as being less suitable than those containing native riparian vegetation.

The hydrologic regime (stream flow pattern) and supply of (and interaction between) surface and subsurface water is a driving factor in the long-term maintenance, growth, recycling, and regeneration of flycatcher habitat (USFWS 2002). As streams reach the lowlands, their gradients typically flatten and surrounding terrain opens into broader floodplains (USFWS 2002). In these geographic settings, the stream-flow patterns (frequency, magnitude, duration, and timing) will provide the necessary riparian conditions (wide channel configuration, high sediment deposition, periodic inundation, recharged aquifers, lateral channel movement, and elevated groundwater tables throughout the floodplain) that result in the development of flycatcher habitat (Poff *et al*. 1997; USFWS 2002). Allowing the river to flow over the width of the floodplain, when overbank flooding occurs, is integral to allow deposition of fine moist soils, water, nutrients, and seeds that provide the essential material for plant germination and growth. An abundance and distribution of fine sediments extending farther laterally across the floodplain and deeper underneath the surface retains much more subsurface water, which in turn supplies water for the development of the vegetation that provides flycatcher habitat and micro-habitat conditions (USFWS 2002). These conditions are found in abundance in a reservoir delta area and in the exposed portion (or conservation pool) of EBR (Moore and Ahlers 2015, Siegle *et al.* 2013).

"Habitat mapping conducted in 2012 (Siegle *et al.* 2013) mapped more than 4500 acres of suitable and moderately suitable habitat within the San Marcial Reach, most of which is in the conservation pool of EBR" (Moore and Ahlers 2015) (figure 5). "However, as time has progressed, much of the habitat in the upper pool as well as that upstream has declined in quality.

Adverse changes due to an incised river channel, prolonged flooding, and drought have all reduced habitat quality. Several areas have transitioned to sparse saltcedar or cattails, both of which reduce the structure and density of suitable [flycatcher] habitat, making it less attractive to breeding [flycatchers]" (Moore and Ahlers 2015).

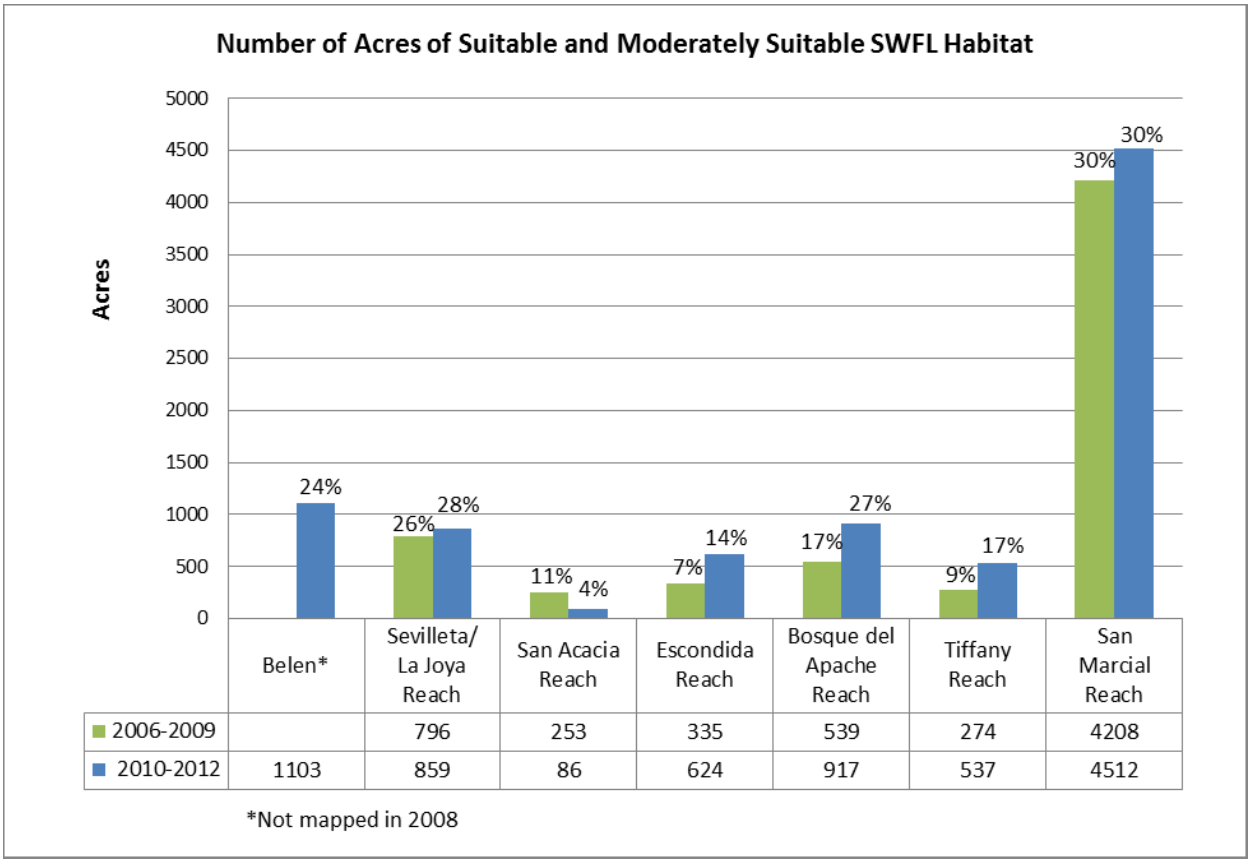


Figure 5. The number of acres of suitable and moderately suitable flycatcher (SWFL) habitat from 2006 to 2009 and from 2010 to 2012 by river reach along the Middle Rio Grande, New Mexico. The percentage associated with each column is the percent of total acreage within each reach that was suitable and moderately suitable (Siegle *et al*. 2013).

Elevational Distribution of Flycatchers within EBR

Historical records document flycatchers in the 1970s when several territories were found in the area then known as Elephant Butte Marsh (Hundertmark 1978, Hubbard 1987). The population of flycatchers within EBR has dramatically increased from 1999 to 2014 when over 250 territories were documented for several years (Figure 2; Moore and Ahlers 2015).

The distribution of territories within EBR has shifted with the development of younger habitats at lower elevations within the conservation pool (Reclamation 2015). From 1995 to 1999, all flycatcher territories detected within EBR were found at elevations above 4400 feet (Elephant Butte Dam spillway elevation = 4407 feet). Flycatcher detections have shifted to lower elevations (as low as 4,325 feet) within EBR from 1999 through 2014 as suitable habitat developed (Reclamation 2015). Although flycatchers are utilizing habitat at elevations lower within the conservation pool, the greatest densities remain in the portion above 4400 feet where suitable habitat is supported by outflows associated with the LFCC Outfall. The first year there

was occupied habitat below 4345 feet was in 2014. Flycatchers are now occupying habitat as low as 4325 feet (Reclamation 2015) (Figure 6).

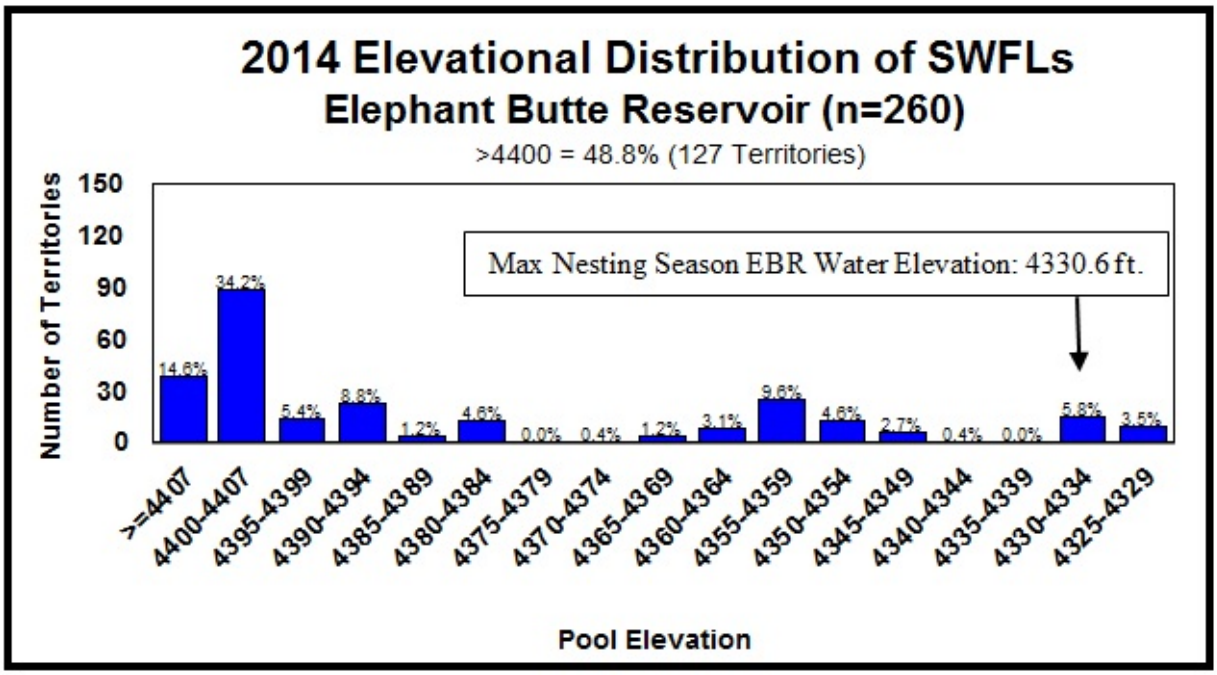


Figure 6. Elevational Distribution of flycatcher territories (SWFL) in 2014 (Reclamation 2015).

Based on 2014 territory distributions within EBR, approximately 48.8% of the flycatcher territories (127 territories) were found above 4400 feet. The total number of territories being found at lower elevations continues to increase as the habitat matures at lower elevations and decreases in suitability at higher elevations (Reclamation 2015) (Figure 7).

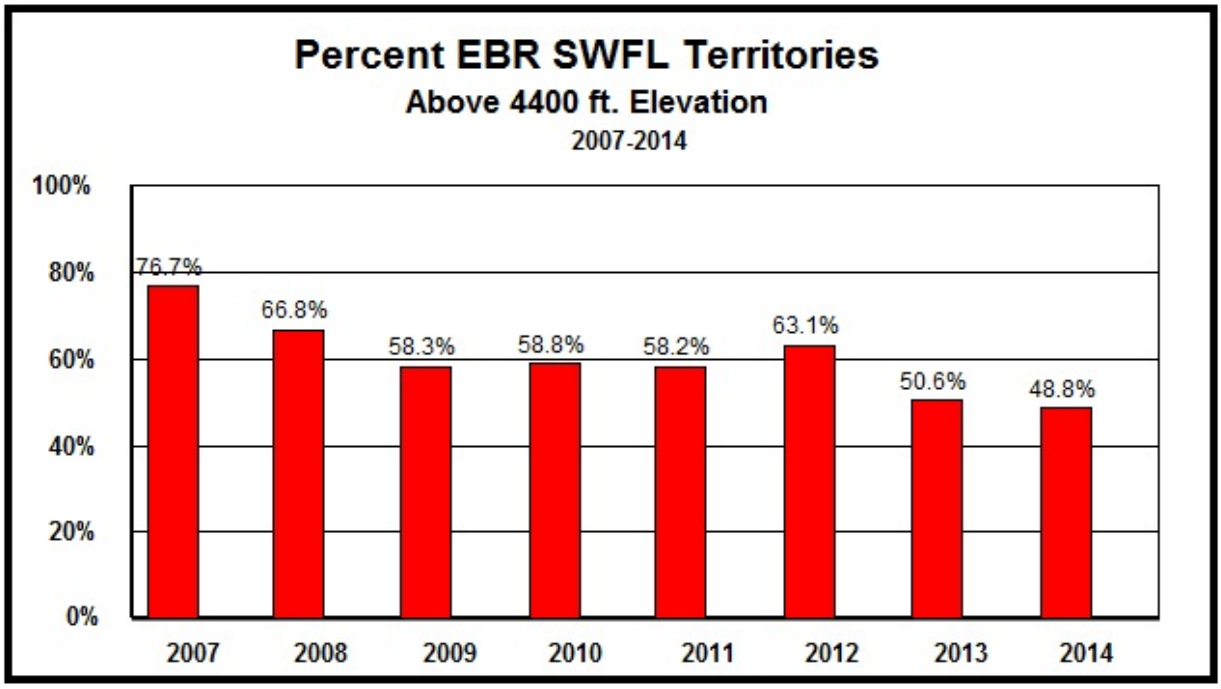


Figure 7. Percent of flycatcher territories (SWFL) above 4400 feet elevation 2007-2014 (Reclamation 2015).

Saltcedar Leaf Beetle (*Diorhabda* spp.)

As described in Reclamation's BA (Reclamation 2015), the saltcedar leaf beetle was released in 2001 (DeLoach *et al*. 2003) to control saltcedar. The saltcedar leaf beetle controls saltcedar by repeated leaf defoliation, this typically occurs during flycatcher breeding season (Tamarisk Coalition). In 2012, saltcedar leaf beetle presence was observed along the Middle Rio Grande north of Albuquerque (Tamarisk Coalition 2015). The saltcedar leaf beetle has now been observed along the Rio Grande throughout the majority of New Mexico (Tamarisk Coalition 2015). Surveys for the saltcedar leaf beetle in EBR documented absence of the species in 2015, however, their presence was documented just downstream and within Caballo Reservoir (Reclamation 2015).

Flycatcher habitat utilization within the Middle Rio Grande, and particularly within EBR has been transitioning from primarily selecting native dominated vegetation patches to those of mixed or exotic stands (Moore and Ahlers 2015) (Figure 8). Recent drought conditions and senescence of native vegetation has allowed for saltcedar to become more dominant within EBR, and flycatchers have been using this lesser quality habitat in greater abundance (Moore and Ahlers 2015).

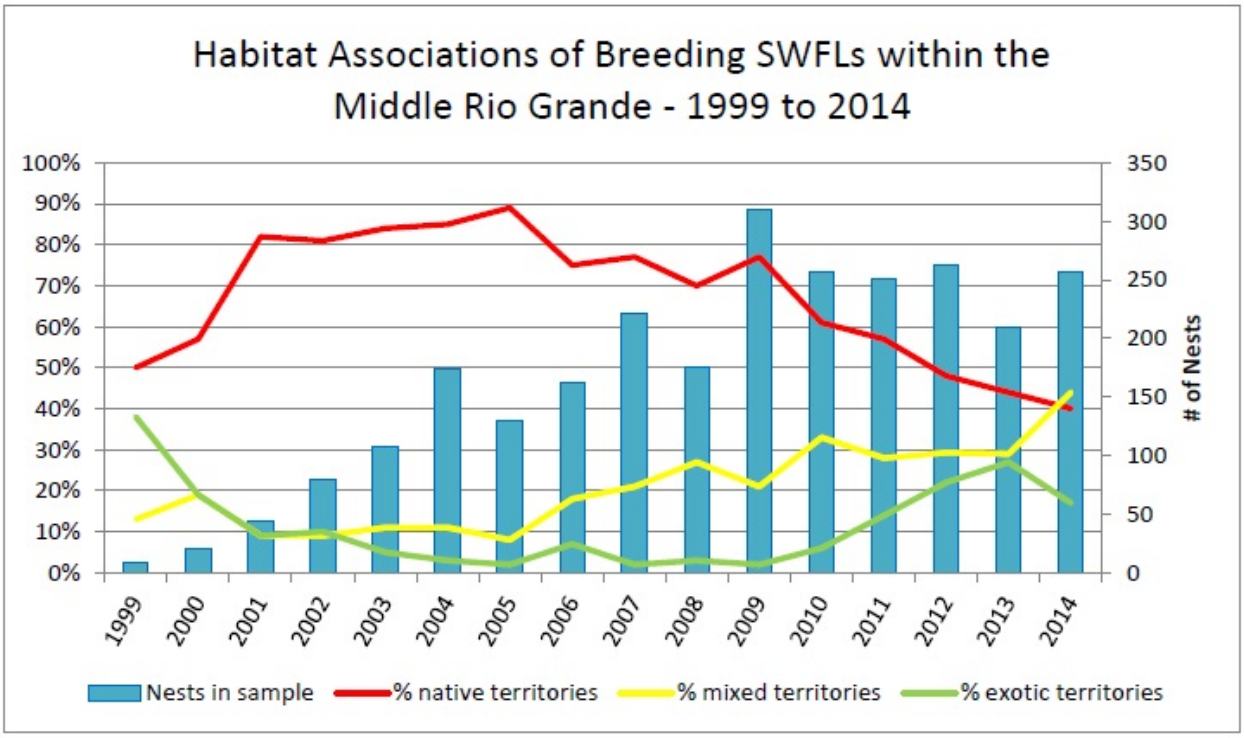


Figure 8. Habitat associations of breeding flycatchers (SWFL) within the Middle Rio Grande 1999-2014 (Moore and Ahlers 2015).

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 flycatcher and/or its critical habitat:

1. Programmatic Biological Opinion on the Effects of Actions Associated with the U. S. Bureau of Reclamation's, U.S. Army Corps of Engineers', and non-federal Entities' Discretionary Actions Related to Water Management on the Middle Rio Grande: The USFWS completed this biological opinion on 17 March 2003, determining the effects of water management by the applicants on the silvery minnow and flycatcher. This biological opinion had one Reasonable and Prudent Alternative (RPA) with several elements. These elements set forth a flow regime in the Middle Rio Grande and described habitat improvements necessary to alleviate jeopardy to both the silvery minnow and flycatcher.
2. Joint Biological Assessment Bureau of Reclamation, Bureau of Indian Affairs, and Non-Federal Water Management and Maintenance Activities on the Middle Rio Grande, New Mexico Middle Rio Grande Project, San Juan-Chama Project, and Upper Colorado Region: Reclamation submitted their BA on February 22, 2013 and a revised BA on August 31, 2015. This consultation includes effects analysis for the silvery minnow, flycatcher, cuckoo, New Mexico Meadow Jumping Mouse (mouse), and their CHs, Pecos Sunflower, and Interior Least Tern as related to Middle Rio Grande water operations and maintenance. This consultation specifically includes the maintenance of the Delta Channel and roads surrounding the historically wet and now dry portion of EBR.
3. US Fish and Wildlife Service's Biological Opinion on the Effects of the Bureau of Reclamation's Delta Channel Maintenance Project: The USFWS completed this

biological opinion on December 22, 2014, determining the effects of river maintenance on delta channel activities on the silver minnow, flycatcher, and cuckoo.

Importance of the Action Area to the Survival and Recovery of the Species
The flycatcher recovery plan identifies five Recovery Units, the Basin and Mojave, Lower Colorado River, Upper Colorado River, Gila River, and Rio Grande. Flycatcher populations are not distributed evenly throughout these Recovery Units, with the majority of individuals found in the Coastal California, Lower Colorado, Gila, and Rio Grande Recovery Units (USFWS 2002).

The Rio Grande Recovery Unit contains the eastern most population of flycatchers, and currently has approximately 24 percent of known territories (Durst *et al*. 2008). The Rio Grande Recovery Unit covers a major portion of the flycatcher's previous range. In order to be well protected against disease and catastrophe, the species should be well distributed geographically. The survival and recovery of the flycatcher is dependent on healthy, self-sustaining populations of birds, which are able to exchange genetic information on occasion, and act as a source population should one area suffer significant losses (Soule 1986). The loss or reduction of a major population within a Recovery Unit could have potentially significant effects to the surrounding Recovery Units if genetic information is lost or if a source population which has been supporting other sites is significantly reduced.

Summary
As EBR receded, areas that were previously inundated have since become suitable for vegetation growth and now provide substantial flycatcher habitat. Water from the LFCC that flows to the west side of EBR also provides standing water where willows have grown and suitable flycatcher habitat is abundant. The large flycatcher population in the San Marcial Reach is an important source population. The habitat present within EBR is becoming overmature or replaced by saltcedar in recent years. A dynamic hydrological system is critical in EBR over the long term in order to increase or maintain plant health and foliage cover, promote natural regeneration (particularly with regard to native vegetation), and scour and deposit nutrients in the soil.

The 2014 abundance of flycatchers in the USFWS Middle Rio Grande Management Unit was 364 territories. Of that total, 260 territories are located within EBR. The USFWS Rio Grande Management Unit Recovery Goal is 100 territories. The latest calculated amount of suitable or marginally suitable habitat was mapped in 2012 with a total of 4512 acres in the San Marcial Reach.

CUCKOO

Habitat Characteristics
At this time, there are no ground truthed habitat suitability models specific to the cuckoo as there are for the flycatcher (Reclamation 2015a). However, the areas used by the flycatcher and cuckoo overlap in several areas in the southwestern United States (79 FR 48547), and thus, the habitat suitability model used for the flycatcher will be used for the cuckoo as a surrogate until a more refined model is available. At this time, USFWS estimates there is the same amount of

suitable or marginally suitable habitat within the San Marcial Reach as there is for the flycatcher, 4512 total acres (Figure 5).

Elevational Distribution of Cuckoos within EBR

Formal cuckoo surveys started along the Middle Rio Grande in 2006 when an estimated population of 44 territories was located from the south boundary of Bosque del Apache NWR to EBR (Carstensen *et al.* 2015). The population of cuckoos specifically within EBR has increased from an estimated 28 territories in 2006 to 49 territories in 2014 (Carstensen *et al.* 2015) (Table 3).

Table 3. Number of YBCU detections and territories by river reach from 2006 to 2014 within the Middle Rio Grande Study Area (Carstensen *et al.* 2015).

River Reach	YBCU Detections/Territories Delineated								
	2006	2007	2008	2009	2010	2011	2012	2013	2014
Belen*	n/s	n/s	n/s	1/0	3/0	16/4	44/15	20/6	24/5
Sevilleta NWR/ La Joya	n/s	n/s	n/s	4/2	1/0	6/2	36/12	19/6	9/2
San Acacia	n/s	n/s	n/s	8/1	3/0	6/1	19/4	20/5	15/4
Escondida	n/s	3/2	19/10	29/9	6/2	15/3	68/21	80/23	27/7
Bosque del Apache NWR	n/s	22/13	35/14	47/11	14/3	17/4	36/10	29/8	34/12
Tiffany	10/6	12/4	7/3	10/3	2/0	4/1	10/2	4/1	2/0
San Marcial	106/38	222/52	299/60	257/69	249/70	202/58	202/57	219/70	190/61
Total	**116/44**	**259/71**	**360/87**	**356/95**	**278/75**	**266/73**	**415/121**	**391/119**	**301/91**
Elephant Butte Reservoir**	76/28	182/36	252/45	211/56	222/64	159/46	177/49	189/60	161/49

NOTE: 2006 to 2008 trends are not directly comparable due to varying degrees of survey efforts and survey area. A minimum of three surveys were conducted between 2006 and 2008. A minimum of four were conducted since 2009. Also, territories were estimated using a different technique beginning in 2009.

* In 2014 an additional 35.5 river miles were added. **Elephant Butte is a subset of San Marcial. n/s = not surveyed

Cuckoo detections are most concentrated in the 4355-4360 foot elevation within EBR (Reclamation 2015) (Figure 9). This area is 47-52 feet lower in elevation than that of the EBR spillway elevation of 4407 feet. Cuckoo detections are now observed in the 4325-4330 elevation (approximately 11.5 river miles to the north of Elephant Butte Dam). In 2014, 19.9% of detections observed within EBR were located in this area.

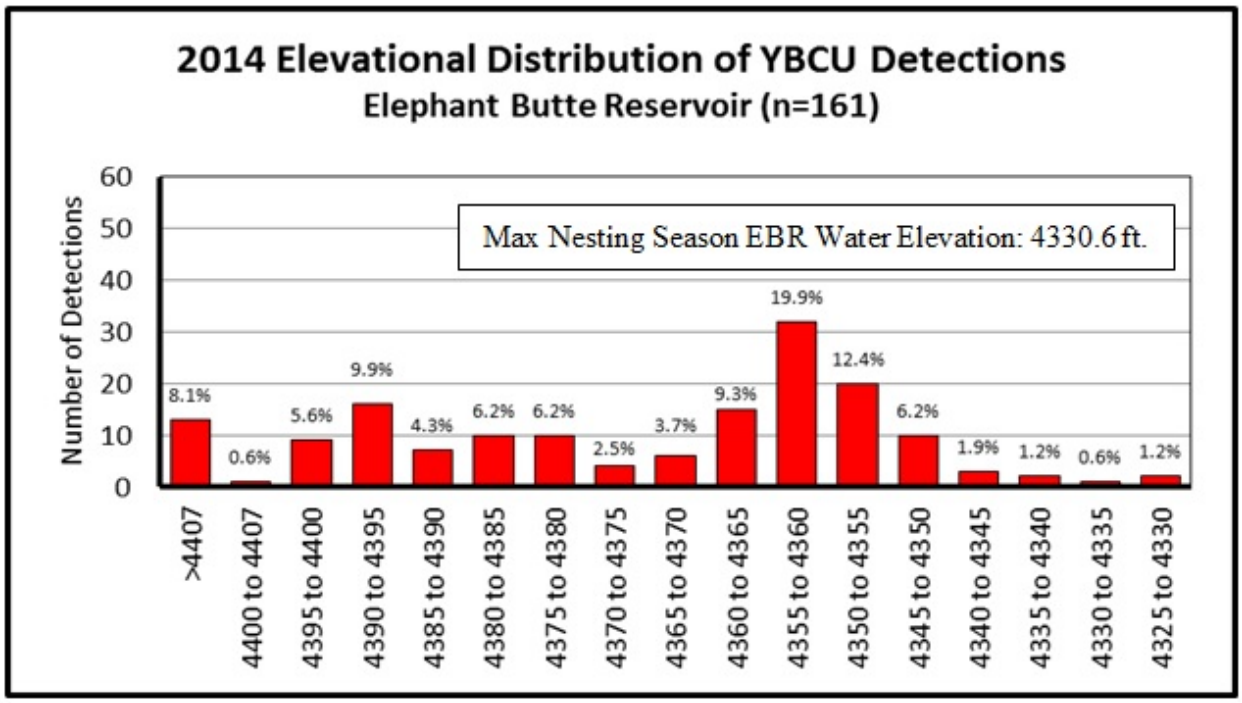


Figure 9. Elevational Distribution of cuckoo detections (YBCU) in 2014 (Reclamation 2015).

Saltcedar Leaf Beetle (*Diorhabda* spp.)
As described in Reclamation's BA (Reclamation 2015) as well as in this Opinion, the saltcedar leaf beetle was released in 2001 (DeLoach *et al.* 2003) to control saltcedar and their presence, as of 2015, was observed as close as Caballo Reservoir (Reclamation 2015).

Though saltcedar is typically not used as a substrate for cuckoo nesting, it is a component of cuckoo habitat (79 FR 48547). As indicated in Reclamation's BA (Reclamation 2015), 25.4% of the 2013 cuckoo territories were located in areas with and exotic or mixed canopy component and 9.4% of the 2013 cuckoo detections were located in areas with exotic understory (with no canopy).

ESA Consultations affecting the Species in the Action Area
There have been limited historic cuckoo consultations within Reclamation's proposed action area. Within the action area, the following present federal, state, and private consultation has included effects analysis for the cuckoo and/or its critical habitat:

1. Joint Biological Assessment Bureau of Reclamation, Bureau of Indian Affairs, and Non-Federal Water Management and Maintenance Activities on the Middle Rio Grande, New Mexico Middle Rio Grande Project, San Juan-Chama Project, and Upper Colorado Region: Reclamation submitted this BA on August 31, 2015. This consultation includes effects analysis for the silvery minnow, flycatcher, cuckoo, New Mexico Meadow Jumping Mouse (mouse), Pecos Sunflower, and Interior Least Tern as related to Middle Rio Grande water operations and maintenance. This consultation specifically includes the maintenance of the Delta Channel and roads surrounding the historically wet and now dry portion of EBR.

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, the species should be well distributed geographically to protect genetic diversity and a source population.

Using the flycatcher as a surrogate species once again, the USFWS (2002) identified several key strategies tied to flycatcher conservation identified in the Recovery Plan (USFWS 2002) that can also be considered for cuckoos such as: (1) populations should be distributed close enough to each other to allow for movement; (2) maintaining/augmenting existing populations is a greater priority than establishing new populations; and (3) a population's increase improves the potential to disperse and colonize. These breeding habitat objectives are incorporated into the delisting criteria because of the importance of providing replacement habitat for dispersing individuals after natural stochastic destruction of existing breeding habitat, and suitable habitat for future population growth. Essential to the survival and recovery of the cuckoo (again using flycatcher as a surrogate) is a minimum size, distribution and spatial proximity of habitat patches that promotes metapopulation stability. Recovery will be enhanced by increasing the number of larger populations and by having populations distributed close enough to increase the probability of successful immigration by dispersing individuals. Thus, to promote recovery, land managers and other conservation entities should strive to protect larger breeding habitat patches within an area to minimize the distance between smaller occupied patches so that they function ecologically as a larger patch.

Summary
As EBR receded, areas that were previously inundated have since become suitable for vegetation growth and now provide substantial cuckoo habitat. The large cuckoo population in the San Marcial Reach, and particularly within EBR, is an important source population. The cuckoo population within EBR is largely concentrated in a section of the historic reservoir pool at a very low elevation and within only 11.5 miles of Elephant Butte Dam. A dynamic hydrological system is critical in EBR over the long term in order to increase or maintain plant health and foliage cover, promote natural regeneration, and scour and deposit nutrients in the soil.

The 2014 abundance of cuckoos in the USFWS Middle Rio Grande Management Unit was 91 territories. Of that total, 49 territories are located within EBR. The latest calculated amount of suitable or marginally suitable habitat (using flycatcher habitat suitability as a surrogate) was mapped in 2012 with a total of 4512 acres in the San Marcial Reach.

EFFECTS OF THE ACTION

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

the effects on flycatcher and its critical habitat, and on cuckoo and its proposed critical habitat a resulting from the proposed action.

FLYCATCHER

To determine the direct impacts (i.e. take in the form of nest inundation and loss of eggs/nestlings) and indirect impacts (i.e. take being harassment in the form of displacement), several assumptions or calculations were made:

- Habitat flooded more than 15 feet for the duration of a summer season would either be too stressed to accommodate nesting flycatchers once the surface water recedes in the reservoir pool or die off completely – thus displacing individuals. This tree height is also the top height from Reclamation's Southwestern Willow Flycatcher Habitat Suitability 2012 report for category 5 vegetation patches, which is where several flycatcher and cuckoo territories fall at the southernmost region of the vegetated portion of EBR.
- In order to calculate occupied suitable or marginally suitable habitat that would be inundated, ArcGIS was used with flycatcher territory data from 2014 as well as the 2012 Reclamation Habitat Suitability layer with LiDAR elevations added to the attribute table. Areas within a 30 meter radius around flycatcher territories from 2014 were selected using the 'Select by Location' tool in ArcGIS, and the selected attribute table data was exported for analysis with Reclamation's Hydrology Model from Technical Memorandum No. 86-68210-2015-05 (Appendix C Reclamation 2015).
- Habitat would naturally regenerate or actively be replanted to reach maturity and attract flycatchers for breeding 3 years after the rise in surface water elevation in the reservoir recedes. Thereby having the same amount of suitable or moderately suitable habitat available for the flycatcher for breeding 3 years after the flooding event. We assumed that flycatchers would reoccupy suitable riparian habitat and abundance would be similar to that detected during 2014 (that is, a total of approximately 364 territories in the USFWS Middle Rio Grande Management Unit).
- Any events where the surface water elevation increases by 10 feet in one summer during the breeding season for flycatchers (May to August) would inundate a nest and 4 eggs or 4 nestlings.
- Although this analysis extends the full duration of the Operating Agreement, it is anticipated that a more robust model or analysis of flycatcher effects would be available by January 2021 to reevaluate the effects associated with this action. This reevaluation would be submitted by Reclamation to USFWS New Mexico Ecological Services Field Office prior to any anticipated high water surface elevation event would take place.
- This analysis did not calculate or predict additional habitat that may become available or occupied farther south than what is present in 2014, instead the baseline data was used as provided by Reclamation.
- This analysis used the timeline and projected surface water elevation as provided in Technical Memorandum No. 86-68210-2015-05 (Appendix C Reclamation 2015). The precise timing of the high surface water events is not as sure to come to fruition as the probability of three high surface water events occurring over the next 34 years, but was used to assist in our analysis.

- These assumptions, as well as using Reclamation's Hydrology Model from Technical Memorandum No. 86-68210-2015-05 (Appendix C Reclamation 2015) with the wetter scenario is all with the intention of being a most conservative estimate for the species and is likely an overestimation.

Under the assumptions above and considering the wetter scenario (P75) with Reclamation's Hydrology Model from Technical Memorandum No. 86-68210-2015-05 (Appendix C Reclamation 2015) alternative 1 (all proposed actions), several acres of suitable or marginally suitable would be inundated to the point where take would occur starting in 2023. At that point, EBR water surface elevation would be 4381 feet (roughly 71 feet higher than the November 2015 water surface elevation of 4309). The lowest elevation flycatcher territories start at a water surface elevation of 4325 feet. It is estimated that 77 flycatcher territories (21% of the population in the USFWS Middle Rio Grande Management Unit) would be displaced; potentially 53 nests (212 eggs/nestlings) would be taken by inundation if this event occurs, and 196 acres of suitable or marginally suitable occupied habitat would be removed. Reservoir levels would be anticipated to remain high the following year, and starting in 2025, natural regeneration of habitat would be anticipated to begin. By 2028, habitat is predicted to reach an age class suitable to recruit flycatcher breeding territories once again, and similar population numbers as 2014 using the assumptions listed above.

To establish a baseline comparison between the historic EBR operations versus the proposed action with the revised diversion ratio adjustment, carryover accounting provision, and the continued storage of SJ-C Project water in EBR, the wetter scenario (P75) of Reclamation's Hydrology Model from Technical Memorandum No. 86-68210-2015-05 (Appendix C Reclamation 2015) alternative 5 (historic EBR operations) was used. Following the assumptions listed above, several acres of suitable or marginally suitable habitat would be inundated to the point where take would occur starting in 2023. At that time, EBR water surface elevation would be 4375 feet. It is estimated that without the proposed action, 69 territories would be displaced; potentially 50 nests (200 eggs/nestlings) would be taken by inundation, and 195 acres of occupied suitable or marginally suitable habitat would be removed.

The next time Reclamation projected that the EBR would have rising water to impact flycatchers would be in the year 2036, when the water surface elevation would reach 4343 feet. At this time, 9 territories would be displaced and 16 nests (64 eggs/nestlings) would be taken by inundation should this event occur. Reservoir water levels would continue to rise the following year to 4375 feet, at which point, an additional 60 territories would be displaced and an additional 34 nests (136 eggs/nestlings) would be taken. EBR water surface elevation would lower once again starting in 2041, and this high water period of time would have displaced a total of 69 territories (19% of the population in the USFWS Middle Rio Grande Management Unit), inundated 50 nests (200 eggs/nestlings), and removed 195 acres of suitable or moderately suitable occupied habitat. By 2044, habitat is predicted to reach an age class suitable to recruit flycatcher breeding territories once again, and at the same population numbers as 2014 using the assumptions listed above.

Using the baseline (historic operations) for comparison once again, in 2036 the water surface elevation would reach 4333 feet (or 10 feet less than the proposed action water surface elevation

during this period of increased water). That would equate to 0 territories being displaced and no nests would be taken by inundation should this event occur. Reservoir water levels would continue to rise the following year to 4366 feet, and 44 territories would be displaced and 29 nests (116 eggs/nestlings) would be taken. EBR water surface elevation would lower once again starting in 2041, and this high water period of time would have displaced a total of 44 territories, inundated 29 nests (116 eggs/nestlings), and removed 80 acres of suitable or moderately suitable occupied habitat.

In 2046, the last high water surface event is modeled to take place. This event will have continually rising water until at least 2050 which is the last year in the model provided by Reclamation. During this wet period, EBR is anticipated to reach full pool capacity of 4407 feet. In 2046, the water surface elevation would be 4348 feet which would displace an estimated 24 flycatcher territories and 16 nests (64 eggs/nestlings). In 2047, the water surface elevation would be 4382 feet displacing an additional 56 flycatcher territories and 34 nests (136 eggs/nestlings). For the next 3 summers, the water surface elevation would rise to a total of 4407 feet. At this time all flycatchers that had territories at an elevation of 4392 or lower would be displaced which would be a total of 119 territories (33% of the population in the USFWS Middle Rio Grande Management Unit), 50 potential nests (200 eggs/nestlings) lost to inundation, and 274 total acres of occupied suitable or moderately suitable habitat removed.

The last high water surface event under baseline (historic operations) conditions will also result in continually rising water in EBR from 2046 until at least 2050 and the full pool capacity would be reached. The effect to flycatchers from the baseline analysis is exactly the same as it would be under the proposed action. Table 4 provides a summary of the analysis totals.

Table 4. Summary of flycatcher take analysis under baseline and proposed action conditions. Amount of impacted suitable or marginally suitable designated critical habitat is the same amount in both baseline and proposed action conditions.

Year	Take of Flycatcher Territories Baseline	Take of Flycatcher Territories Proposed Action	Take of Flycatcher Nests (eggs/ nestlings) Baseline	Take of Flycatcher Nests (eggs/ nestlings) Proposed Action	Temporary Removal of Occupied Suitable or Marginally Suitable Habitat (ac) Baseline	Temporary Removal of Occupied Suitable or Marginally Suitable Habitat (ac) Proposed Action	Temporary Removal of Suitable or Marginally Suitable Designated Critical Habitat (ac)
2023	69	77	50 (200)	53 (212)	195	196	N/A
2036	0	9	0	16 (64)	N/A	N/A	N/A
2037	44	60	29 (116)	34 (136)	80	195	N/A
2046	24	24	16 (64)	16 (64)	N/A	N/A	N/A
2047	56	56	34 (136)	34 (64)	196	196	N/A
2048	39	39	N/A	N/A	78	78	599

Effect to Designated Critical Habitat

A portion of EBR is inside of designated critical habitat. Using the same assumptions as the section above, the first time designated critical habitat would be negatively impacted by the rising reservoir pool would be in 2048 when the water surface elevation would reach 4407 feet

resulting in 599 acres of suitable or marginally suitable critical habitat would be removed/taken/destroyed by inundation for an extended period of time deeper than 15 feet. This event would occur under both the baseline and proposed action conditions.

Summary

The three short term high surface water periods modeled for EBR is anticipated to reduce the quantity of suitable and moderately suitable flycatcher habitat within the deeply flooded areas temporarily. However, higher elevation areas of suitable or moderately suitable habitat with standing water would likely attract flycatchers and provide benefits to vegetation. Vegetation could have an increase in foliage and percent cover with water needs being more adequately met when compared to these recent dry years, which in turn would better shelter flycatchers from predators, weather elements, and parasitism. Should EBR water levels stay at the low recent elevation, habitat would be expected to overmature and lose suitability over time, which has been observed at the upper end extent of EBR. A fluctuation in the water surface elevation within the reservoir mimics the dynamic habitat condition where habitat is created and destroyed over time creating the successional age classes flycatchers depend on. Though there would be short term losses in the form of harassment, displacement, habitat loss, and in some cases nest (with possible egg and/or nestling) loss, over the long term, the fluctuations of water surface elevation in the reservoir pool would be positive for the large flycatcher population and habitat located in this area. As indicated by the baseline versus proposed action comparison, much of this fluctuation in surface water elevation is beyond the scope of what is in Reclamation's discretion. Ultimately, using the available data and tools described within this section, it is estimated that there will be 3 high surface water periods lasting between 2-5 years each and followed by a period of low surface water periods lasting between 5-11 years. These high surface water periods will ultimately take either directly or indirectly and as a result of Reclamation's proposed action, a total of 33 flycatcher territories, 24 nests (96 eggs/nestlings), 81 acres of historically occupied suitable or marginally suitable habitat (outside of designated critical habitat), and 0 acres of designated critical habitat.

CUCKOO

To determine the direct impacts (i.e. take in the form of nest inundation and loss of eggs/nestlings) and indirect impacts (i.e. take being harassment in the form of displacement), we made the same assumptions/calculations that were done for the flycatcher with the following exceptions:

- When using ArcGIS to determine acres of suitable or moderately suitable occupied habitat that would be affected by EBR surface water elevations, instead of selecting areas within a 30 meter radius around 2014 flycatcher territories (as was done for the flycatcher analysis), a 500 meter radius was used around 2014 cuckoo territories as a better representative of territory size specific to the cuckoo.
- Suitable or marginally suitable habitat that was used for the flycatcher was also used as a surrogate for cuckoos.
- Since cuckoo nest monitoring does not take place in the USFWS Middle Rio Grande Management Unit, and since the cuckoo survey protocol states cuckoos most frequently

have a single brood, the number of estimated territories was used as a surrogate to find the total number of nests. Nests would be assumed to contain 4 eggs or nestlings.

- As was assumed for the flycatcher, habitat is assumed to naturally regenerate or actively be replanted to reach maturity and attract cuckoos for breeding 3 years after the rise in surface water elevation in the reservoir recedes. Thereby having the same amount of suitable or moderately suitable habitat available for the cuckoo for breeding 3 years after the flooding event. We assumed that cuckoos would reoccupy suitable riparian habitat and abundance would be similar to that detected during 2014 (that is, a total of approximately 91 territories in the USFWS Middle Rio Grande Management Unit).
- Any events where the surface water elevation increases by 10 feet in one summer during the breeding season (June to August) could inundate a nest. There were two years in which the analysis resulted in the number of cuckoo nests anticipated to become inundated were more than the number of territories displaced. In these two events, we increased the number of territories anticipated to be displaced to match the number of nests. This was done with the assumption that once a nest was inundated, the adult pair would also be indirectly displaced and harassed.
- To determine territories from the amount of detections, a 30% detection to territory equivalent was used based on the 161 detections/49 territories found in the Elephant Butte subset of the San Marcial Reach data (Carstensen *et al*. 2015).

Under the assumptions above and considering the wetter scenario (P75) with Reclamation's Hydrology Model from Technical Memorandum No. 86-68210-2015-05 (Appendix C Reclamation 2015) alternative 1, which incorporates all proposed actions and a warmer, wetter climate pattern at EBR, several acres of suitable or marginally suitable would be inundated to the point where take would occur starting in 2023. At that point, EBR water surface elevation would be 4381 feet (roughly 71 feet higher than the November 2015 water surface elevation of 4309). The lowest elevation cuckoo territories are currently documented at a water surface elevation of 4325 feet. It is estimated that 28 cuckoo territories (31% of the population in the USFWS Middle Rio Grande Management Unit, or 18-28% of the estimated territories in New Mexico, or 3-4% of the rangewide estimated population (including Mexico)) would be displaced, no nests would be taken by inundation if this event occurs (because the nesting cycle is delayed one month when compared to flycatchers and by that time, the water surface level elevation would not gain 10 feet in the course of the rest of the breeding season), and 830 acres of suitable or marginally suitable occupied habitat would be removed. Reservoir levels would be anticipated to remain high the following year, and starting in 2025, natural regeneration of habitat would be anticipated to begin. By 2028, habitat is predicted to reach an age class suitable to recruit cuckoo breeding territories once again, and the total population of cuckoos would be assumed to be similar to the 2014 total using the assumptions listed above.

To establish a baseline comparison between the historic EBR operations versus the proposed action, the wetter scenario (P75) of Reclamation's Hydrology Model from Technical Memorandum No. 86-68210-2015-05 (Appendix C Reclamation 2015) alternative 5 (historic EBR operations) was used. Following the assumptions listed above, several acres of suitable or marginally suitable habitat would be inundated to the point where take would occur starting in 2023. At that time, the EBR water surface elevation would be 4375 feet. It is estimated that

without the proposed action, 27 territories would be displaced and 790 acres of occupied suitable or marginally suitable habitat would be removed.

The next time EBR would have rising surface water to impact cuckoos would be in 2036 when the water surface elevation reaches 4343 feet. At this time, 1 territory would be displaced. Reservoir water levels would continue to rise the following year to 4375 feet, at which point, an additional 33 territories would be displaced and 33 nests would be taken. EBR water surface elevation would lower once again starting in 2041, and this high water period of time would have displaced a total of 33 territories, inundated 33 nests (132 eggs/nestlings), and removed 790 acres of suitable or moderately suitable occupied habitat. By 2044, habitat is predicted to reach an age class suitable to recruit cuckoo breeding territories once again, and at the same population numbers as 2014 using the assumptions listed above.

Using the baseline (historic operations) for comparison once again, in 2036 the water surface elevation would reach 4333 feet (or 10 feet less than the proposed action water surface elevation during this period of increased water). That would equate to no territories being displaced and no nests would be taken by inundation during this event. Reservoir water levels would continue to rise the following year to 4366 feet, at which time 30 territories would be displaced and 30 nests (120 eggs/nestlings) would be taken, and 224 acres of suitable or moderately suitable occupied habitat would be removed. EBR water surface elevation would lower once again starting in 2041. By 2044, habitat is predicted to reach an age class suitable to recruit cuckoo breeding territories once again, and at the same population numbers as 2014 using the assumptions listed above.

In 2046, the last high water surface event is modeled to take place. This event will have continually rising water until at least 2050 which is the last year in the model provided by Reclamation. During this wet period, EBR is anticipated to reach full pool capacity of 4407 feet. In 2046, the water surface elevation would be 4348 feet which would displace an estimated 4 cuckoo territories. In 2047, the water surface elevation would be 4382 feet displacing an additional 34 cuckoo territories and 34 nests. For the next 3 summers, the water surface elevation would rise to a total of 4407 feet. At this time all cuckoos that had territories at an elevation of 4392 or lower would be displaced which would be a total of 44 territories (48% of the population in the USFWS Middle Rio Grande Management Unit, or 28-44% of the estimated New Mexico population, or 4-7% of the rangewide estimated population (including Mexico)), 34 potential nests (136 eggs/nestlings) lost to inundation, and 1,250 total acres of occupied suitable or moderately suitable habitat removed.

The last high water surface event under baseline (historic operations) conditions will also result in continually rising water in EBR from 2046 until at least 2050 and the full pool capacity would be reached. The effect to cuckoos from the baseline analysis is exactly the same as it would be under the proposed action. Table 5 provides a summary of the analysis totals.

Table 5. Summary of cuckoo take analysis under baseline and proposed action conditions. Temporary removal of suitable or marginally suitable designated critical habitat is the same amount in both baseline and proposed action calculations.

Year	Take of Cuckoo Territories Baseline	Take of Cuckoo Territories Proposed Action	Take of Cuckoo Nests (eggs/ nestlings) Baseline	Take of Cuckoo Nests (eggs/ nestlings) Proposed Action	Temporary Removal of Occupied Suitable or Marginally Suitable Habitat (ac) Baseline	Temporary Removal of Occupied Suitable or Marginally Suitable Habitat (ac) Proposed Action	Temporary Removal of Suitable or Marginally Suitable Designated Critical Habitat (ac)
2023	27	28	N/A	N/A	790	830	N/A
2036	0	1	N/A	N/A	N/A	N/A	N/A
2037	30	33	30 (120)	33 (132)	224	790	N/A
2046	4	4	N/A	N/A	N/A	N/A	N/A
2047	34	34	34 (136)	34 (136)	830	830	N/A
2048	6	6	N/A	N/A	420	420	599

Effect to Proposed Critical Habitat

A portion of EBR is inside of proposed critical habitat. Using the same assumptions as the section above, the first time proposed critical habitat would be negatively impacted by the rising reservoir pool would be in 2048 when 599 acres of proposed critical habitat would be removed. This event would occur under both the baseline and proposed action conditions.

Summary

In summary, the three short term high water periods modeled for EBR is anticipated to reduce the quantity of suitable and moderately suitable cuckoo habitat within the deeply flooded areas temporarily. However, higher elevation areas of suitable or moderately suitable habitat with standing/flowing water would likely attract cuckoos. Vegetation could have an increase in foliage and percent cover with water needs being more adequately met when compared to these recent dry years, which in turn would better shelter cuckoos from predators and weather elements. Should EBR water levels stay at the current low elevation, and suitable or moderately suitable habitat would be occupied at an elevation of 4325 feet or higher, habitat would be expected to overmature and lose suitability over time at the northern end of EBR. A fluctuation of the water surface elevation within the reservoir would mimic the dynamic habitat condition where habitat is created and destroyed over time creating the successional age classes cuckoos depend on. Though there would be short term losses in the form of harassment, displacement, habitat loss, and in some cases nest loss, over the long term, the fluctuations in the reservoir pool would be positive for the large cuckoo population and habitat located in this area.

Ultimately, using the available data and tools described within this section, it is estimated that there will be 3 high surface water periods lasting between 2-5 years each and followed by a period of low surface water periods lasting between 5-11 years. These high surface water periods will ultimately take either directly or indirectly and as a result of Reclamation's proposed action, a total of 5 cuckoo territories, 3 nests (12 eggs/nestlings), 606 acres of historically occupied suitable or marginally suitable habitat (outside of proposed critical habitat), and 0 acres of proposed critical habitat.

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 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. Cumulative effects include:

- Increased urban use of water, including municipal and private uses. Further use of surface water from the Rio Grande will reduce river flow and decrease available habitat for flycatchers or cuckoos.

- Contamination of the water (i.e., power plants, sewage treatment plants, runoff from small feed lots and dairies, and residential, industrial, and commercial development). A decrease in water quality and gradual changes in floodplain vegetation from native riparian species to non-native species (i.e., saltcedar) could adversely affect the flycatcher and cuckoo. High levels of selenium and mercury can accumulate in invertebrate prey and adversely impact survivorship and fecundity in the flycatcher and cuckoo.

- Wildfires and wildfire suppression in the riparian areas along the Rio Grande may have an adverse effect on flycatchers and cuckoos. Wildfires are a fairly common occurrence in the bosque (riparian area) along the Rio Grande. The increase in wildfires has been attributed to increasingly dry, fine fuels and ignition sources. The spread of the highly flammable plant, saltcedar, and drying of river areas due to river flow regulation, water diversion, lowering of groundwater tables, and other land practices is largely responsible for these fuels. Wildfires have the potential to destroy flycatcher and cuckoo habitat.

- The removal of non-native vegetation (i.e. saltcedar or Russian olive) through mechanical or biological control (i.e. saltcedar leaf beetle (*Diorhabda sp.*)), can adversely affect the amount of available flycatcher and cuckoo habitat.

- The effect global warming may have on the flycatcher and cuckoo is still unpredictable. However, mean annual temperature in Arizona increased by 1 degree per decade beginning in 1970 and 0.6 degrees per decade in New Mexico (Lenart 2005). In both New Mexico and Arizona the warming is greatest in the spring (Lenart 2005). Higher temperatures lead to higher evaporation rates which may reduce the amount of runoff, groundwater recharge, and lateral extent of rivers such as the Rio Grande. Increased temperatures may also increase the extent of area influenced by drought (Lenart 2003).

The USFWS anticipates that these conditions and types of activities will continue to threaten the survival and recovery of the flycatcher and cuckoo by reducing the quantity and quality of habitat through the continuation and expansion of habitat degrading actions.

CONCLUSION

After reviewing the current status of the flycatcher and cuckoo, designated critical habitat, the environmental baseline for the action area, the effects of the proposed action, and cumulative effects; it is USFWS's biological opinion that the Operating Agreement and storage of SJ-C Water, as proposed in the August 2015 RGP BA, is not likely to jeopardize the continued existence of the flycatcher or cuckoo or result in adverse modification of designated or proposed critical habitat. Population numbers and habitat availability would be expected to decrease in the USFWS Middle Rio Grande Management Unit in the short term when EBR water surface elevations are high, until these levels recede and the riparian vegetation again attains suitable habitat for flycatchers and cuckoos. However, it would be anticipated that for the long term, the fluctuating EBR water surface elevation will maintain the dynamic environment that is important for flycatchers and cuckoos. Therefore, we conclude that the primary constituent elements of flycatcher designated critical habitat and cuckoo proposed critical habitat to the north of the action area will serve the intended conservation role for the species with implementation of the proposed action while EBR water surface elevations are high.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and federal regulation 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 by USFWS to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by USFWS 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, as appropriate, for the exemption in section 7(o)(2) to apply. The action agency 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 adherence 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 USFWS as specified in the incidental take statement. [50 CFR §402.14(i)(3)]

Amount or Extent of Take Anticipated
USFWS developed the following incidental take statement based on the scenario of the wetter scenario (P75) from Reclamation's Hydrology Model from Technical Memorandum No. 86-68210-2015-05 (Appendix C Reclamation 2015) with alternative 1compared to alternative 5, which incorporates all proposed actions at EBR compared to baseline historic operations. USFWS realizes that this scenario would inundate the absolute most amount of habitat and, thus, would have the worst short term impact to the flycatcher and cuckoo. USFWS also recognizes that these impacts may not be realized, and would likely be an overestimate.

FLYCATCHER

Take would be expected in the form of harassment and displacement in the areas where inundation is expected to occur over 15 feet. Rising water levels will stress or kill willows, depending on the extent, timing and duration of which they are inundated. This take calculation is done with the assumptions that once habitat has been inundated past the crown for the duration of one summer, that habitat (as well as the flycatchers) would be gone until soil is exposed and willows regenerate again for a period of 3 years, at which point, flycatchers would be assumed to reestablish the same amount of territories as they did in 2014. This take calculation considers what territories would have been taken due to baseline conditions minus what is taken due to the proposed action.

In events where the water levels rise 10 feet or more in a given breeding season, take in the form of flooded nests and potentially eggs or nestlings is expected. This take calculation considers what territories would have been taken due to baseline conditions minus what is taken due to the proposed action.

Critical habitat for the flycatcher within the reservoir starts at river mile 54 and extends north past the action area. The elevation at this location has a minimum of 4380 feet. Using the same assumption as above where it would cause 15 feet of flooding over the course of a growing season to stress and/or kill willows, impacts to areas designated as critical habitat would likely occur during just one high surface water event in EBR, and would happen regardless of if the proposed action took place.

Table 6. Estimated take of flycatcher territories and nests, as well as impacted habitat due to the proposed action.

Number of High Water Surface Events	Duration of High Water Surface Event	Take of Flycatcher Territories	Take of Flycatcher Nests (eggs/ nestlings)	Temporary Removal of Occupied Suitable or Marginally Suitable Habitat (ac)	Temporary Removal of Suitable or Marginally Suitable Designated Critical Habitat (ac)
3	2-5 years	33	24 (96)	81	0

CUCKOO

The same calculations and assumptions were made for the cuckoos as were made for the flycatcher regarding take of territories and nests, as well as the amount of impacted occupied suitable or marginally suitable habitat, and proposed critical habitat and are displayed in table 7.

Table 7. Estimated take of cuckoo territories and nests, as well as impacted habitat due to the proposed action.

Number of High Water Surface Events	Duration of High Water Surface Event	Take of Cuckoo Territories	Take of Cuckoo Nests (eggs/ nestlings)	Temporary Removal of Occupied Suitable or Marginally Suitable Habitat (ac)	Temporary Removal of Suitable or Marginally Suitable Designated Critical Habitat (ac)
3	2-5 years	5	3 (12)	606	0

EFFECT OF TAKE

The USFWS has determined that this level of anticipated take is not likely to result in jeopardy to the flycatcher or cuckoo, because the number that may be taken would not impair flycatcher recovery goals for the Middle Rio Grande Management Unit and is relatively small when compared to the number of flycatchers and cuckoos currently present within the occupied range. This is assuming the populations would bounce back to the 2014 level after each high surface water elevation period since there is enough time between the 2023, 2036, and 2046 high flow events where the habitat could reasonably regenerate, reach maturity, and reestablish occupancy to the 2014 level between each event. This effect analysis also takes into consideration that if EBR water surface elevations remain low and do not fluctuate, the habitat available now would likely become overmature and no longer be considered suitable, and thereby reducing population numbers over time.

REASONABLE AND PRUDENT MEASURES

The USFWS believes the following Reasonable and Prudent Measures (RPMs) are necessary and appropriate to minimize impacts of incidental take of the flycatcher due to activities associated with the proposed project.

1. Minimize take of flycatchers and cuckoos in the form of adults harassed and nests (i.e., eggs, or fledglings) lost due to EBR high surface water elevations.
2. Minimize the effects of suitable habitat loss due to proposed action and maximize discretionary actions to create suitable habitat in EBR and within 25 miles of EBR (defined as being from Highway 380/San Antonio, NM to Percha Dam), with no net loss over the next 35 years.
3. Develop a plan to acquire or develop the best scientific information available on EBR water surface elevations over 35 years, and estimate the quantities of flycatcher and cuckoo suitable habitat that will be gained and lost on an annual basis within five years.
4. Coordinate with and report to the USFWS New Mexico Ecological Services Field Office on annual progress, including an assessment of the population status of the flycatcher and

cuckoo and associated progress towards recovery. Ensure that the USFWS New Mexico Ecological Services Field Office receives all electronic copies of annual or other reports, ArcGIS data, or any other relevant information.

TERMS AND CONDITIONS

Compliance with the following terms and conditions must be achieved in order to be exempt from the prohibitions of section 9 of the ESA. These terms and conditions implement the Operational Plan described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

To implement RPM 1 and 2, Reclamation shall:

1.1 Deliver water to Caballo, to the extent possible, to minimize the number of nests taken during anticipated high surface water elevation increases during summer months when flycatchers and cuckoos are breeding.

1.2 Ensure that habitat lost to high surface water elevation is replaced with the same amount (or more) suitable or moderately suitable habitat (as defined by Reclamation's Southwestern Willow Flycatcher Habitat Suitability 2012, Siegle *et. al.* 2013) within 3 years of the decline in EBR surface water elevation during each high water surface elevation event. This is to ensure that habitat availability remains the same as in 2012 amounts within 25 miles of EBR.

1.2.1 In the event suitable habitat does not naturally regenerate within the 3-year period of the decline of EBR high surface water elevation as described in RPM 1.2, to offset the acreage lost in EBR, Reclamation must either:

- Develop and implement a plan for actively planting or restoring habitat within 25 miles of EBR,
- Continue to implement the restoration projects listed within the updated Flycatcher/Cuckoo Management Plan (Reclamation 2012) to offset the lost suitable habitat from the proposed action.

1.3 Monitor and evaluate groundwater conditions within the exposed portion of EBR.

To implement RPM 3, Reclamation shall:

3.1 By January 2021, develop and include a flycatcher and cuckoo suitable habitat simulation model to better address some of the assumptions made in the BA and this Opinion, and prior to any potential high water surface elevation event. This model should incorporate the habitat that is evolving from a native to mixed or exotic vegetation communities within EBR, and assess impacts the saltcedar leaf beetle would have. This model should provide a more efficient methodology for determining Reclamation's take accountability for their discretionary actions under the Operating Agreement when compared to baseline conditions. The model should also better determine or verify the estimated take as indicated in the ITS above.

3.2 Complete a reassessment of the water surface elevations and impacts to flycatchers and cuckoos in 10-year intervals starting January 2016.

3.3 Use information collected from Term and Condition 3.1 and 3.2 to coordinate with the USFWS, and to develop new or modify existing practices to minimize the adverse effects of the operating agreement through adaptive management practices.

To implement RPM 4, Reclamation shall:

4.1 Annually evaluate progress towards recovery for the flycatcher and cuckoo to ensure that the proposed actions are not precluding recovery and that population levels have not declined appreciably.
4.2 Coordinate with Service to determine if re-initiation of consultation is warranted and if adaptive management is necessary.

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 USFWS recommends the following conservation activities:

a. Encourage adaptive management of storage, flows and conservation of water to benefit listed species.
b. Work to secure long-term water sources to support habitat restoration activities.
c. Work to further conduct habitat/ecosystem restoration projects along the Rio Grande to benefit the flycatcher and cuckoo.
d. Monitor, maintain, and expand habitat restoration areas.
e. Coordinate the reporting of flycatcher and cuckoo survey data and its management, collection, entry, and reporting with the USFWS and other agencies.
f. Inform partners and the public about saltcedar leaf beetle issues. Continue to improve an understanding about saltcedar using the latest science.

RE-INITIATION NOTICE

This concludes formal consultation on the action(s) described in the 2015 Operating Agreement BA. As provided in 50 CFR § 402.16, re-initiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) The amount or extent of incidental take is exceeded; (2) new information reveals effects of the agency action that may affect listed species or designated critical habitat in a manner or to an extent not considered in this biological opinion; (3) the agency action is subsequently modified in a manner that causes an effect to the listed species or designated critical habitat not considered in this biological opinion; (4) adaptive management that includes additional earth work is needed to repair or maintain the project after the initial construction phase; or (5) 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 re-initiation.

The incidental take statement provided for cuckoo proposed critical habitat in this conference opinion does not become effective until the critical habitat is designated and the conference opinion is adopted as the biological opinion issued through formal consultation. At that time, the project will be reviewed to determine whether any take of the habitat has occurred. Modifications of the opinion and incidental take statement may be appropriate to reflect that take. No take of the critical habitat may occur between the designation of the critical habitat and the adoption of the conference opinion through formal consultation, or the completion of a subsequent formal consultation. Requests for USFWS adoption of this conference opinion must be in writing.

In future correspondence on this project, please refer to Consultation Number 02ENNM00-2015-F-0734. If you have any questions or would like to discuss any part of this Opinion, please contact Vicky Ryan, of my staff, at (505) 761-4738 or Vicky_ryan@fws.gov.

Wally Murphy

WALLY MURPHY

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