United States Department of the Interior

FISH AND WILDLIFE SERVICE

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November 3, 2017

Consultation # 02ENNM00-2017-F-0367

Gilbert G. Anaya, Division Chief
Environmental Management Division
U.S. International Boundary and Water Commission
4171 N. Mesa St., Suite C310
El Paso, TX 79902

RE: Long-Term River Management of the Rio Grande Canalization Project

Dear Mr. Anaya:

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to section 7 of the Endangered Species Act (ESA) of 1973 (16 U.S.C. 1531-1544), as amended (Act). The U.S. International Boundary and Water Commission's (USIBWC) Biological Assessment (BA) was dated March 16, 2017. At issue are impacts that may result from USIBWC's proposed Long-Term River Management of the Rio Grande Canalization Project (RGCP) located in Dona Ana and Sierra Counties, New Mexico and El Paso County, Texas (Proposed Action). You determined that the Proposed Action may affect and is likely to adversely affect the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) (flycatcher); and may affect, but is not likely to adversely affect the threatened yellow-billed cuckoo (*Coccyzus americanus*) (cuckoo) and the endangered interior least tern (*Sternula antillarum*) (least tern).

In general, the Proposed Action includes long-term river management of the RGCP including activities such as channel maintenance, vegetation management, and island destabilization/removal activities. The Proposed Action also includes habitat restoration features and water right acquisition to be used to benefit riparian habitat.

The USFWS concurs with your determination for the cuckoo and least tern for which USIBWC made a "may affect, but not likely to adversely affect" determination. Our concurrence is based on the following understanding of your project:

- Seasonal restrictions in maintenance activities will avoid impacts to the cuckoo and least tern during the breeding season and when the species may be present within the action area;
- Activities associated with the vegetation management such as increasing the width of riparian vegetation along the bankline could benefit cuckoos by providing additional foraging habitat;
- Increased acquisition of USIBWC water rights is anticipated to support developing riparian vegetation and supplement water supply in the occurrence of surface water supply shortages which would benefit cuckoos;
- Channel maintenance, vegetation management, and island destabilization/removal activities will not remove any nesting habitat for cuckoos or least terns, or otherwise cause displacement of the species; and
- Construction buffer zones will be established around future cuckoo territories in coordination with the USFWS to ensure avoidance of species impacts.

Your BA addressed additional species and/or their critical habitat (where applicable) where "no effect" determinations were made. Section 7 of the ESA does not require agencies to consult on Federal Actions determined to have "no effect" on species covered by the Act, though we appreciate your consideration of the species.

Attached is the biological opinion (BO) is associated with impacts from the Proposed Action on flycatchers. This 15-year BO is based on information provided in your March 16, 2017 BA, field trip on January 18 – 20, 2017 about the Proposed Action, email and phone exchanges, and other sources of information (such as historic consultations and annual reports for example). It is also based on the understanding that the Proposed Action will remain the same once the current Record of Decision is renewed. Literature cited in this BO is not a complete bibliography of all literature available on flycatchers, flycatcher habitats, or on potential effects to the flycatcher considered in this BO. A complete administrative record of this consultation is on file at the New Mexico Ecological Services Field Office (NMESFO).

The USFWS appreciates USIBWC's efforts to identify and minimize effects to listed species from this Long-Term River Management of the RGCP. For further information, please contact David Campbell, Branch Chief, at 505-761-4745 or Vicky Ryan, Biologist, at 505-761-4738 of my staff. Please refer to the Consultation # 02ENNM00-2017-F-0367 in future correspondence concerning this project.

Sincerely,

Susan S Millsap

Susan S. Millsap
Field Supervisor

Gilbert G. Anaya, Division Chief

cc:
Area Manager, Albuquerque Area Office, Bureau of Reclamation, Albuquerque, NM (electronic copy)
Director, New Mexico Department of Game and Fish, Santa Fe, NM (electronic copy)
General Manager, El Paso County Water Improvement District #1, Clint, TX (electronic copy)
Treasurer/Manager, Elephant Butte Irrigation District, Las Cruces, NM (electronic copy)

FINAL BIOLOGICAL OPINION FOR U.S. INTERNATIONAL BOUNDARY AND WATER COMMISSION LONG-TERM RIVER MANAGEMENT OF THE RIO GRANDE CANALIZATION PROJECT, NEW MEXICO

August 16, 2017

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CONSULTATION HISTORY

- Project planning began in 1999, with USIBWC, USFWS and others attending meetings and field trips to discuss project features, design, and construction methods.
- February 2004, the USIBWC sent a letter to the USFWS requesting consultation pursuant to Section 7 of the ESA. This consultation concerned the effects of the Integrated Land Management Alternative (ILMA) — as set forth in the final Environmental Impact Statement released later that year—on the endangered flycatcher, the endangered least tern (*Sterna antillarum*), and the then-threatened bald eagle (*Haliaeetus leucocephalus*).
- June 28, 2004, the USFWS concurred with an effect determination of " May Affect, Is Not Likely to Adversely Affect" for all three listed species (SWCA 2011). The USFWS prepared the *Fish and Wildlife Coordination Act Report for the Rio Grande Canalization Project, New Mexico and Texas*, dated March 2005.
- September 9, 2011, the USIBWC provided the draft BA to the USFWS to initiate formal consultation on possible effects of the proposed ILMA for Long-Term Management (decision in 2009 ROD) of the RGCP in Sierra County and Doña Ana County, NM, and El Paso County, TX on the endangered flycatcher and on the flycatcher's proposed critical habitat (USIBWC 2016). The action described in the 2011 BA included:
    - Habitat restoration on 30 sites;
    - Levee maintenance, rehabilitation, and construction;
    - Channel maintenance at two locations;
    - Phasing out grazing; and
    - Vegetation treatments, including annual mowing and the implementation of "No Mow" areas (managed grasslands, flycatcher habitat, and native riparian enhancements at restoration sites).
- August 2012, the USFWS issued a BO which provides RPMs that the USIBWC will undertake to ensure the protection of the flycatcher, including establishing and maintaining breeding habitat and developing a Flycatcher Management Plan (Consultation No. 02ENNM00-2012-F-0016 and Previous Consultation No. 2-22-00-I-025 (USFWS 2012)).
- March 2017, USIBWC provided a Final BA (draft BA provided November 2016) with an updated review of the species and updated proposed action which now includes:
    - Sediment and non-sediment removal;
    - Bank stabilization;
    - Island destabilization/removal; and
    - Invasive species removal in "No Mow" areas.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The Proposed Action was originally described in USIBWC 2004, USIBWC 2009, SWCA 2011, USIBWC 2016 and USIBWC 2017a. A brief summary of the action is provided within this section as opposed to a complete synopsis. Please refer to USFWS 2012 BO "Description of the Proposed Action" section (USFWS 2012) and USIBWC's Updated BA (USIBWC 2017a) for additional details.

The RGCP is considered the 105.4 mile (169.6 kilometer (km)) river corridor that extends along the Rio Grande from below Percha Diversion Dam, in Sierra County, New Mexico to American Dam in El Paso County, Texas (Figure 1). The Act of Congress of June 4, 1936 (Public Law 648; 49 Stat. 1463) grants authority to the USIBWC to construct, operate and maintain the RGCP. Riparian habitat and levees bordering riparian habitat on both sides of the river is included within this action area.

Proposed Actions

The purpose of the Proposed Action is to continue management of the RGCP, including the levee system maintenance, channel maintenance activities, floodway/vegetation management, and adaptive management.

Levee maintenance is proposed to occur along all 105.4 miles of the river corridor from Percha to American Dam. Specifically, levee maintenance includes encouraging grass growth on the levee slopes for erosion control, cutting brush and tall weeds from the slopes, and repairing levee slopes. Levee slopes are mowed to prevent growth of brush and trees that could obstruct flows, or cause root damage to the structure itself. Levee maintenance also includes road grading and resurfacing with gravel as needed.

Levee construction and rehabilitation is proposed to occur in the Courchesne, Nemexas, and Canutillo reaches. Work will begin or continue in Courchesne reach and includes levee improvement, drain structure rehabilitation/replacement and levee and floodwall construction. The Nemexas reach will include levee improvement, and Canutillo reach will include levee and floodwall construction. Work is to ensure flood capacity and enable levee certification. Levee improvement, drain structure rehabilitation/replacement, and levee and floodwall construction includes all activities to support the standards set forth by the National Flood Insurance Program managed by Federal Emergency Management Agency to comply with minimum design, operations and maintenance standards (44 CFR §65.10). This could include activities such as raising the elevation of a number of levee segments for improved flood protection for example (SWCA 2011, USIBWC 2016).

Channel maintenance activities will occur as proposed in the River Management Plan (RMP) Part 4 (USIBWC 2016). The RMP proposed a 5-year plan of sediment excavation activities and laid out potential implementation of conceptual alternatives for non-sediment removal activities. The proposed channel maintenance activities include sediment and non-sediment removal. Sediment removal includes dredging/sandbar removal and localized sediment removal at specific sites. Non-sediment removal includes modifying the vortex weir at Tierra Blanca, constructing low-elevation spur dikes, rip rap/gravel addition or planting, bank stabilization, vegetation removal on islands, island destabilization or removal, and constructing sediment traps at arroyos.

Activities associated with floodway/vegetation maintenance include annual removal of obstructions to flood flows and maintenance of flood capacity within the floodway and between the flood control levees (SWCA 2011, USIBWC 2016). Specifically, floodway/vegetation maintenance activities include:

- Continued mowing 2,674 acres (ac) (1,082.1 hectares (ha)) within the 105.4 mile river corridor;
- Implementation of 30 riparian habitat sites on 553 ac (223.8 ha). To date, 15 riparian habitat sites have been established, of which, 11 are targeted for flycatcher breeding habitat;
- Development and implementation of an environmental water transaction program; and
- Removal of invasive vegetation from "No Mow" areas through means other than mowing.

Also proposed is USIBWC's RMP adaptive management strategy in implementing river management alternatives (USIBWC 2016). Adaptive management strategies for consideration include:

- The evaluation of restoration activity progress as well as success of established habitat outside of restoration sites on a yearly basis;
- "No Mow" areas to be managed to reduce predominance of invasive species and to promote native vegetation communities. "No Mow" areas include buffers around flycatcher habitat;
- In areas with well-developed riparian flycatcher habitat where islands will be removed, USIBWC will consider the feasibility of transplanting the native vegetation by the root ball to other areas where bank stabilization is necessary. The creation of inset floodplains will also be considered;
- Widening the fringe "No Mow" areas to 35 feet (ft) (10.6 meters (m)); and
- The creation of bank cuts and river meanders will be considered so that during high flow, water comes into the area or creates an island inside the floodplain.

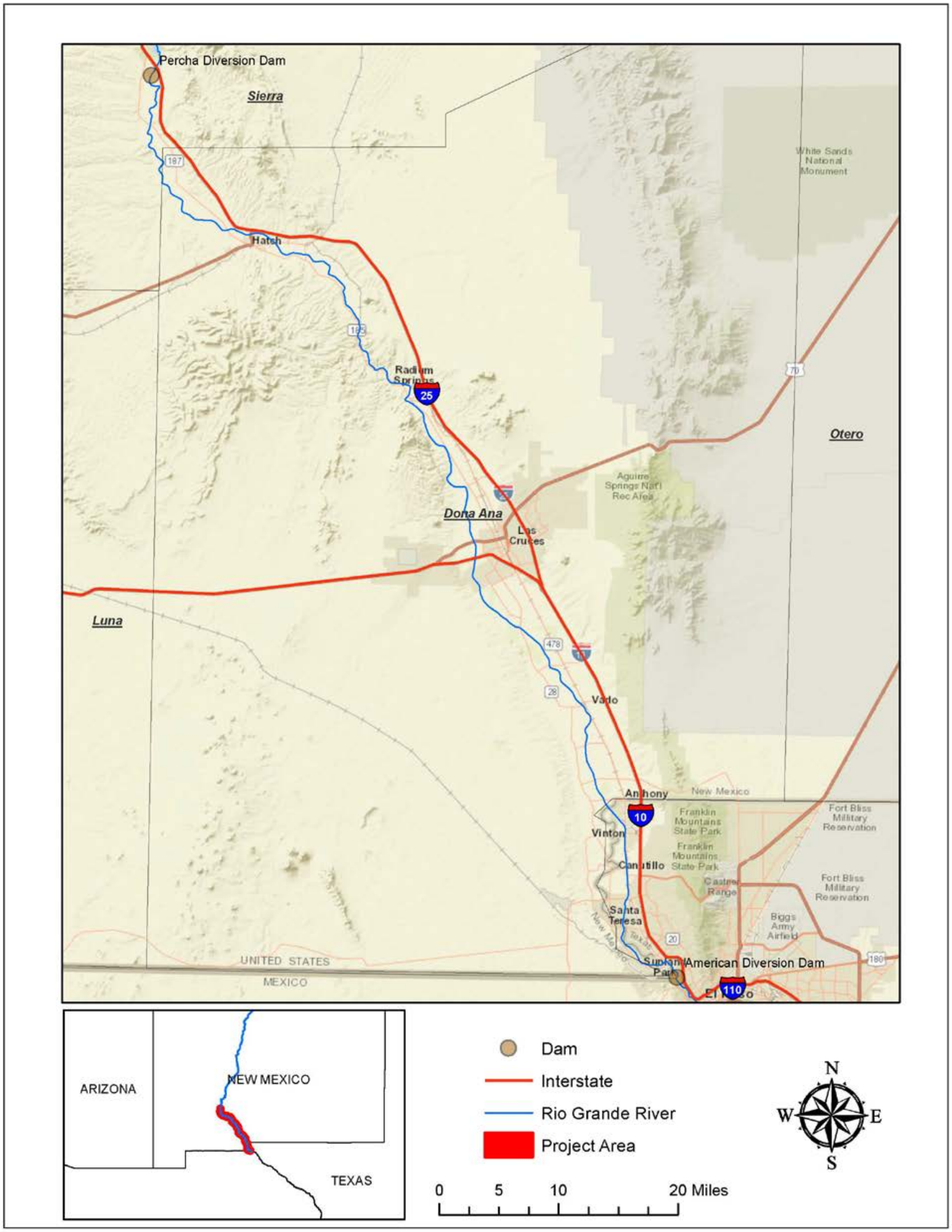


Figure 1. The RGCP, a 105.4-mile river corridor extending along the Rio Grande from below Percha Diversion Dam, in Sierra County, New Mexico to American Diversion Dam in El Paso County, Texas.

Conservation Measures

The following are conservation measures proposed that are associated with protecting water resources, aquatic habitat and soils (USIBWC 2016, 2017a):

- Proper permits or authorization will be required for any river water use related to construction activities, such as water spraying for dust abatement;
- During construction near the river and during maintenance work within the river, Best Management Practices (BMPs) and spill control procedures will be used to prevent contamination and increased erosion to the river. Servicing of heavy equipment will be done out of the riparian zone;
- When feasible, work in the channel will be conducted during low-flow or dry river conditions when water levels are lowest (during non-irrigation and non-flood periods), approximately September 15 to March 1;
- Levees will be reinforced if channel migration threatens levee protection;
- Signage will indicate that riparian use and access will be limited during construction activities to limit erosion, minimize damage to vegetation, and provide refuge areas where wildlife can remain undisturbed;
- No wetlands or other waters will be filled in during maintenance activities;
- Temporary materials and equipment-staging areas for construction areas will be reclaimed and revegetated with suitable native woody trees and shrubs. The USIBWC will monitor performance of these environmental measures;
- Channel excavation work will be performed with bulldozers, excavators, front end loaders and scrapers either from the channel bank or from within the channel;
- Mechanical treatment will be conducted in weather conditions that provide for dryer soil conditions to avoid creating ruts and compacting soil;
- Dust control measures, such as sprinkling/irrigation, mulch, vegetative cover, and wind breaks, will be used in construction sites where there is the potential for air and water pollution from dust transport by high winds;
- Heavy equipment used for brush reduction will minimize impacts to native brush. The least invasive equipment available will be used for maintenance activities. Heavy equipment can be tracked, not wheeled, for less brush impact. Heavy equipment that is wheeled and not tracked may leave ruts when turning, but may also compact the soil less;
- Spoil from channel sediment excavation will be deposited in upland locations to ensure spoil will not be re-deposited into the river. Upland deposit locations will be pre-approved by USIBWC management. Sediment will be stabilized by vegetation, where needed;
- Sediment for restoration bank work on restoration sites located in New Mexico will be moved to nearby floodway locations and stabilized by revegetation during shavedowns and bank preparation. Shavedowns will be designed to promote backflow inundation and reduce the possibility of sediment entering the river;
- Crews will minimize incidental fallback of excavated material into the riverbed. Water quality is anticipated to decrease during sediment excavation, but should improve upon completion of maintenance work;
- Before ground-disturbing maintenance work, a conference will be held with maintenance crews to inform them of the potential for disturbing subsurface cultural resources, and the

procedures involved in the event that this occurs. Precautions will be taken to ensure that archaeological assistance is promptly available in case of a discovery;

- Manual (non-mechanical), removal of saltcedar will be used during maintenance on the river margin. Woody debris as a result of saltcedar reduction will be mulched, burned, or removed from the floodway;
- Herbicide will be applied directly to targeted plants in a manner to minimize runoff to surface water. All herbicides will be licensed herbicides and will be used in conformance with labeled instructions. Herbicides will not be aerially applied over open water, instead, formulations labeled for use in or near aquatic habitats will be used;
- If fish become stranded when equipment is operating in the river or arroyo tributaries, USIBWC will work with USFWS to identify individuals that can salvage fish and return them back to the main river channel; and
- Prescribed burns will incorporate BMPs (e.g., careful selection of fire lines and weather conditions, and avoidance of intense burns) to limit runoff into the river.

The following are conservation measures proposed that are associated with protecting vegetation (USIBWC 2016, 2017a):

- Existing roads through the floodplain will be used to avoid impacts to vegetated areas;
- Staging areas are located in areas that will avoid impacts to vegetated areas;
- Vegetation will be monitored (species, composition, abundance and distribution) before and after vegetation treatments. Saturated and ponded areas will be avoided during mechanical and chemical treatments;
- Herbicides will be sprayed by hand application to targeted species, whenever feasible. Herbicides will not be aerially applied on areas where sensitive riparian vegetation such as cottonwoods, willows, and screwbean mesquite (*Prosopis pubescens*) are extensively intermingled with saltcedar; and
- Prescribed burns will be conducted in accordance with techniques identified in a plan to be developed by the USIBWC with guidance from federal and state resource management agencies. Degraded or burned areas will be inter-seeded with native grasses and forbs to further enhance the establishment of desirable browse and forage species.

For chemical treatments and prescribed burning to vegetation, additional BMPs will be implemented for air quality and cultural resource protection, including:

- Vapor amounts will be minimized by dispensing herbicide in a vegetable oil solution, limiting airborne particulates. Application of this treatment will not occur during high wind conditions;
- Smoke management techniques will be used to determine smoke dispersion prior to prescribed burns; and
- USIBWC Cultural Resources Specialists will conduct pre- and post-burn site inspections for cultural resources.

The following are conservation measures proposed that are associated with protecting wildlife (USIBWC 2016, 2017a):

- Biologists will survey the action area for listed species and their habitat, critical habitat for the southwestern willow flycatcher and determine the nearest documented flycatcher territories;

- Construction will occur outside of the migratory bird breeding season from September 1 through February 28. If construction is necessary during the migratory bird breeding season, surveys will be conducted per Section 2 of the RMP and treatment will be selected to minimize the effect;
- Vegetation treatments with herbicide will occur outside the nesting season (i.e., September 1 through March 1). If treatments must occur during the migratory bird-nesting season, surveys will be conducted and active nests will be marked and avoided;
- Mechanical vegetation management in the "No Mow" areas will be conducted outside the flycatcher breeding season, from May 15 through August 15 of each year. If treatments must occur during the migratory bird-nesting season, surveys will be conducted and active nests will be marked and avoided;
- A 0.25-mile buffer will be established around each flycatcher territory. If work must be conducted during the breeding season, no work will be conducted prior to 9 am, work will be reduced to shortest time frame possible to minimize impacts, and noise will be kept to a minimum;
- USIBWC will continue to implement several activities in regards to restoration sites (i.e. staggering plantings to increase structural and age diversity, discontinuing mowing, and removing saltcedar (unless near a territory with drought-affected willows));
- Work to provide supplemental water to support flycatcher habitat; Licenses, permits, and leases will be reviewed for potential impacts to flycatchers. If impacts will occur then BMPs outlined in the endangered species management plan will be included; and
- No potential bald eagle winter roosting trees will be disturbed during maintenance activities. Presence/absence of bald eagles will be monitored during maintenance work in the fall and winter.

Additionally, USIBWC proposes to continue with the implementation of several conservation measures and incorporation of reasonable and prudent measures from the 2012 BO (USFWS 2012) into management activities that provide benefit to flycatchers such as:

- Manage specific flycatcher habitat (i.e. 11 Restoration Sites);
- Manage "No Mow" areas;
- Implement the Environmental Water Transaction Program;
- Implement the Flycatcher Management Plan;
- Monitor groundwater levels;
- Coordinate with US Bureau of Reclamation (USBR) on flycatcher and cuckoo surveys; and
- Coordinate with other entities such as Elephant Butte Irrigation District (EBID), New Mexico State Parks Division, and other stakeholders.

STATUS OF THE SPECIES

The southwestern subspecies of the willow flycatcher was federally listed as endangered in 1995, without critical habitat (USFWS 1995). The flycatcher is a small, insect-eating generalist, neotropical migrant bird (USFWS 2002). It grows to about 5.8 inches (in) (15 centimeters (cm)) in length. It eats a wide range of invertebrate prey including flying, and ground- and vegetation-dwelling insects of terrestrial and aquatic origins (Drost et al. 2003). The flycatcher spends the winter in locations such as southern Mexico, Central and South America (Paxton et al. 2011).

Flycatchers use riparian habitats that are generally dense, shrubby, moist, and that have abundant flying insects (USFWS 2002). Riparian habitat is used throughout the flycatcher's range for breeding and stop-over habitat during their long-distance migration. Breeding habitat is largely associated with perennial (persistent) streamflow that can support the expanse of vegetation characteristics needed by breeding flycatchers. The hydrologic regime and supply of surface and subsurface water is a driving factor in the long-term maintenance, growth, recycling, and regeneration of flycatcher habitat (USFWS 2002).

At the end of 2007, 1,299 flycatcher breeding territories were estimated to occur throughout southern California, southern Nevada, southern Utah, southern Colorado, Arizona, and New Mexico (Durst et al. 2008). Some of the flycatcher breeding sites having the highest number of territories are found along the Middle Rio Grande and upper Gila River in New Mexico, and Roosevelt Lake and the San Pedro and Gila River confluence area in central Arizona. Critical habitat was first designated in 1997, but was recently redesignated in 2013 (USFWS 1997, 2013). Range wide there are 208,973 ac (84,568 ha) of designated critical habitat.

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

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 Gooddings willow (*Salix gooddingii*), coyote willow (*Salix exigua*), Geyer's willow (*Salix geyeriana*), arroyo willow (*Salix lasiolepis*), red willow (*Salix laevigata*), yewleaf willow (*Salix taxifolia*), pacific willow (*Salix lucida*), boxelder (*Acer negundo*), tamarisk (saltcedar) (*Tamarix* spp.), Russian olive (*Eleagnus angustifolia*), buttonbush (*Cephalanthus* spp.), cottonwood (*Populus* spp.), stinging nettle (*Urtica dioica*), alder (*Alnus* spp.), velvet ash (*Fraxinus velutina*), poison hemlock (*Conium maculatum*), blackberry (*Rubus* spp.), seep willow (*Baccharis salicifolia*), oak (*Quercus* spp.), rose (*Rosa* spp.), sycamore (*Platanus* spp.), false indigo (*Baptisia australis*), Pacific poison ivy (*Toxicodendron diversilobum*), grape (*Vitis* spp.), Virginia creeper (*Parthenocissus quinquefolia*), Siberian elm (*Ulmus pumila*), and walnut (*Juglans* spp.) and some combination of:

    a. Dense riparian vegetation with thickets of trees and shrubs that can range in height from about 6 to 98 feet (ft) (about 2 to 30 m). Lower-stature thickets [6 to 13 ft (2 to 4 m) 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 13 ft (4 m) 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 50–100 percent) tree or shrub (or both) canopy (the amount of cover provided by tree and shrub branches measured from the ground); and

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 0.25 ac (0.1 ha) or as large as 175 ac (70 ha).

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).

For more detailed information on the biology, status of the species and critical habitat, see USFWS 2002, 2013, 2014.

Local Distribution and Abundance
USBR personnel classified the suitability of riparian habitat for breeding flycatchers within the active floodplain of the Rio Grande from Caballo Dam, NM to El Paso, TX (Moore and Ahlers 2013). This entire area is situated within the USFWS defined Lower Rio Grande Management Unit (LRGMU) (USFWS 2002). Seven different study reaches were delineated based on geographic landmarks, habitat characteristics, and ongoing flycatcher surveys (Figure 2).

The RGCP portion of the Rio Grande includes the lower six reaches and does not include the Caballo reach, nor a portion of the Percha reach in the area from Caballo to Percha Dam. Surveys conducted in 2016 for flycatchers within the RGCP portion of these reaches recorded 89 flycatchers with most (67) detected in the Hatch Reach. The Las Cruces Reach, was not formally surveyed for flycatchers in 2016. Sections of the lowest reach, Mesilla Reach, were surveyed but no migrant or resident flycatchers were detected (Dillon et al. 2017).

For the fourth straight year, the recovery goal of 25 territories for the LRGMU was exceeded. The USBR located 105 flycatchers in the LRGMU during the 2016 survey season. Thirty of these birds were determined to be migrants based on their date of detection and lack of territorial behavior. The remaining birds comprised 50 territories including 25 pairs, one unpaired male and 24 resident birds for which breeding status was not determined (Dillon et al. 2017). This represents a slight increase in territory numbers from 2015 (Figure 3).

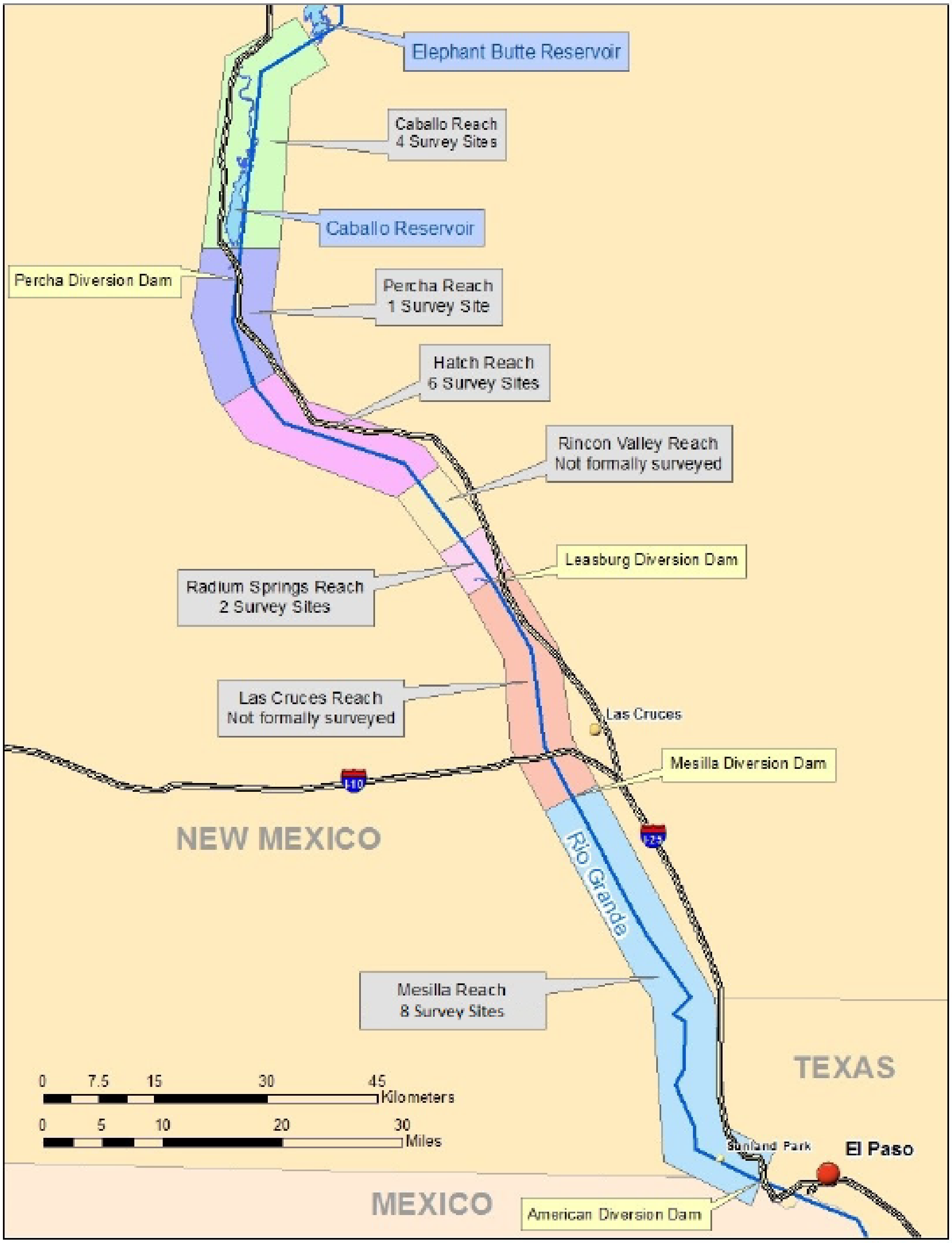


Figure 2. USBR Study Reaches for 2016 flycatcher surveys along the Lower Rio Grande, New Mexico (Dillon et al. 2017).

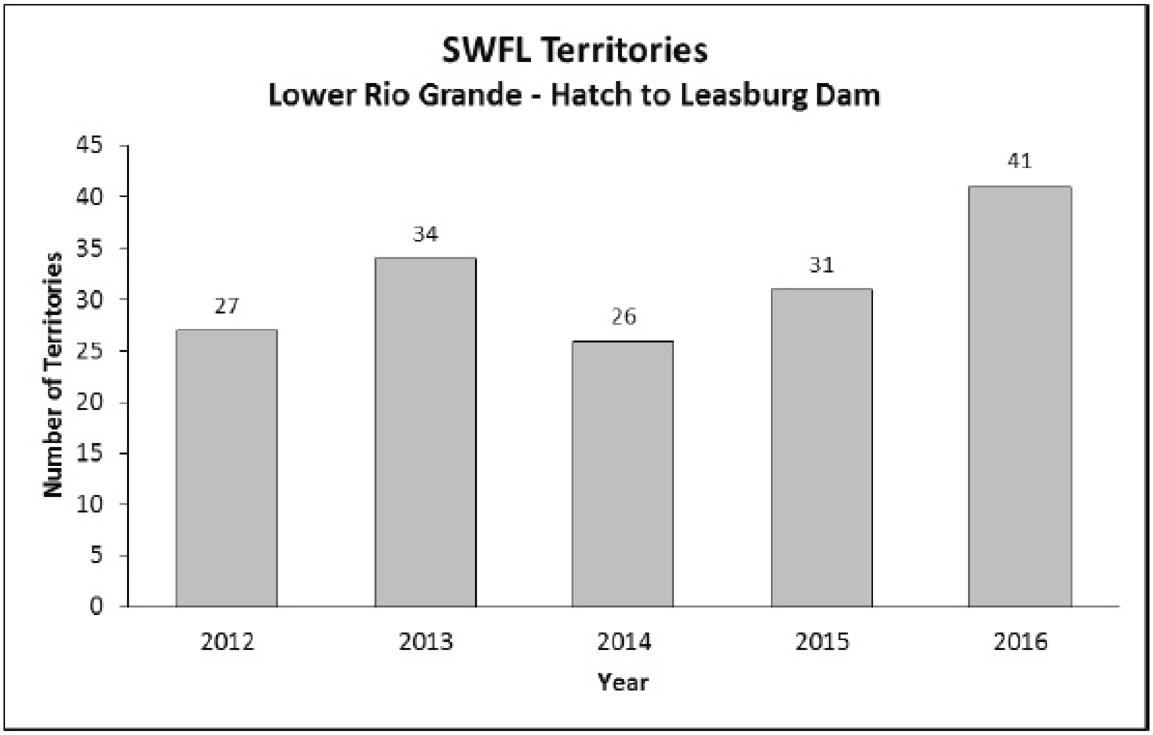


Figure 3. Flycatcher territories observed within the action area along the Lower Rio Grande, New Mexico from 2012 to 2016 (Dillon et al. 2017).

Habitat surveys conducted within the RGCP in July and August 2016 found an overall increase in available suitable habitat within the RGCP. Habitats classified as moderately to highly suitable increased from 201.6 ac (81.6 ha) in 2012 to 243.6 ac (98.6 ha) in 2016 (Moore and Ahlers 2013, USIBWC 2017a). The total area classified as highly suitable in the RGCP is still very limited but has increased from approximately 5.7 ac (2.3 ha) to 16.6 ac (6.7 ha) (USIBWC 2017a). The most downstream reaches, those closest to the international border, had the highest percentage of non-habitat in 2012 and this remained the case in 2016. The majority of highly suitable habitat was located within the vicinity of Hatch, NM. Not surprisingly, this reach was also home to the majority of resident flycatchers detected during formal surveys in 2012, 2015, and 2016 (Moore and Ahlers 2013, 2015a, Dillon et. al. 2017).

Flycatchers within the RGCP area often occupy relatively narrow strips and patches of predominately native habitat (coyote willow) (Dillon et. al. 2017).

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present impacts of all Federal, State, or private actions in the action area, the anticipated impacts of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the impact of State and private actions which are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

Dams, Operations, and Diversions

The Lower Rio Grande has been used for agricultural purposes dating back several centuries (Scurlock 1998; Stotz 2000). Pueblo people were utilizing small diversions and ditch irrigation on a limited scale at the time of Spanish exploration in 1591. Ditch irrigation began in the mid-1600's in the El Paso/Juarez valley, and direct diversions were underway by at least the late 1700's (Stotz, 2000). The area of irrigated farming steadily increased in New Mexico until it reached a peak of 127,800 ac (50,500 ha) in 1880 (Scurlock, 1998). Thus, agricultural diversions of stream flow were extensive in the Lower Rio Grande at the time flow gaging began in the 1880's. Stotz (2000) estimated that more than half the summer stream flow from the Rio Grande between 1890 and 1893 was consumed by irrigation or was lost to seepage and evapotranspiration.

During this history, several major floods scoured valleys within the state of New Mexico (Scurlock 1998). While devastating for agricultural activities, infrequent but very large floods reset riparian habitat succession and rejuvenate large stands of the riparian habitat upon which flycatchers depend (Graf et al. 2002). Extensive flooding can result in widespread loss of riparian habitat initially, but in the intervening years, the riparian habitat recovers and matures. Floods exert important physical and biological controls on riparian habitats, because they inundate and moisten floodplain soils, raise water tables, recharge aquifers, mobilize and deposit sediment on flood plains creating seed beds for riparian plants, flush salts and redistribute nutrients, cause river channels to relocate or meander, create abandoned channels and backwaters, disperse and scarify plant propagules, scour and relocate vegetation, and deposit organic materials that have higher water-holding capacity than the inorganic materials in the substrate (USFWS 2002).

Smaller floods that inundate, but do not destroy riparian vegetation, help to maintain a diversity of herbaceous plant species that may also play important roles in maintaining the food base and breeding habitat of flycatchers. Many of the riparian plant species in the southwest and within the action area, such as Goodding willow, are pioneer species that depend on periodic winter and spring flood disturbance for regeneration. Cottonwoods and willows release small, windborne seeds timed to the distributional patterns of flows common to the Rio Grande (Moss 1938; McBride and Strahan 1984; Graf 1994). For example, cottonwood seeds are released coinciding with higher flows, while willow seeds are released during lower flows when sandier substrates are exposed and are wet enough to allow for germination (McBride and Strahan 1984).

In the 1900s, the United States (and Mexico) began constructing dams and channelizing the Rio Grande to control sediment, drainage, flooding, and to provide a more secure and stable water supply primarily for agricultural use (USIBWC 2004). In particular, the Rio Grande Project was a regional water initiative coordinated by the USBR that was designed to furnish irrigation water for about 178,000 ac (72,034 ha) of agricultural land, and electric power for communities and industries in southern New Mexico and west Texas. Elephant Butte Reservoir, constructed between 1912 and 1916, provides most of the storage for the Rio Grande Project, while three diversion dams (i.e., Percha, Leasburg, Mesilla) route stored water to various irrigation canal systems in the action area. Elephant Butte Dam was completed and operations began in 1916 which slowed the periodic flooding of the river downstream (Stotz 2000; USFWS 2002). In 1933, Congress approved plans to straighten, stabilize, and shorten the Lower Rio Grande east of El Paso, and to construct Caballo Dam a short distance downstream of Elephant Butte Dam, which was completed in 1938. Operation of these tandem reservoirs allows for electric power generation at Elephant Butte and seasonal release of irrigation water at Caballo (USIBWC 2004; Schmandt 2010).

Additionally, construction of sediment and flood control dams in tributary arroyos occurred in the early 1970s by the United States Natural Resources Conservation Service (USACE 1996). A combination of flood control dams at Broad Canyon, Green Canyon, Arroyo Cuervo, and Berrenda Arroyo, controls discharges over 300 square miles (777 km^2) of the tributary basins to the RGCP, and reduces the flood peak frequency by an estimated 40 percent (USACE 1996).

Elephant Butte and Caballo Dam (and American Dam) have reduced the normal flows downstream; sometimes completely dewatering the channel below El Paso (Parsons 2001, 2003). The existing hydrology and flood control operations created by dams, diversions, and provisions for safe channel capacity now make flood events large enough to destabilize the current vegetation and change the channel pattern, extremely unlikely in the Lower Rio Grande. Under current operations, discharges from Caballo and Elephant Butte Reservoirs may cease entirely during much of November to February (USIBWC 2004). Flows in the river are reduced to seepage (including agricultural return flows), minor groundwater accretion, and urban water returns downstream of Caballo Dam. Winter flows near the town of Hatch are typically about 20 cubic feet per second (cfs) (0.6 cubic meters per second (cms)). Flows at Mesilla Dam are about 50 cfs (1.4 cms) and accrete to about 160 cfs (4.5 cms) below the American Dam Diversion (USFWS 2001). Peak irrigation water use occurs from mid-April through October, and flows are typically 1,000 to 2,500 cfs (28.3 to 70.8 cms). The channel and floodway have a capacity ranging from 22,000 cfs (623 cms) in the upper reaches to 12,000 cfs (340 cms) in the lower reaches (Baker 1943).

Reduced annual flow shrinks both peak and low flows, which increases channel stability, and decreases water tables that can reduce riparian habitat (Graf et al. 2002). Construction of Elephant Butte and Caballo Dam significantly reduced the floods and high flow pulses in the action area (Schmandt 2010). The width of riparian habitat and biomass decreases with decreased mean and median annual flow volume and drainage size in alluvial river channels (Stromberg 1993). Reduced peak flow shrinks the high flow channel from braided to single thread and thereby reduces riparian habitat dynamics (Stotz 2000). With reduced low flows, or during drought or extended loss of surface flow during drying events, the alluvial groundwater levels also decline often resulting in mortality of riparian vegetation. Dams eliminated the spring snowmelt peak flows, and moderate flows were extended between April and September that facilitated agricultural water withdrawals (Stotz 2000).

The decreased annual fluctuations in flow, have also contributed to the simplification of the channel system, reduced the size and amount of beaches, sand bars, or floodplains, and reduced or simplified riparian vegetation, thereby reducing river function and processes, and increasing conditions that favored saltcedar replacement of native vegetation in the action area (Everitt 1993; Graf et al. 2002). Loss and alteration of surface flows reduced productivity and native riparian habitat quality which subsequently impacts the production and biomass of insects important to flycatcher breeding habitat in the action area.

Channelization: Channel Narrowing, Levee Protection, and Channel Straightening

After Elephant Butte Reservoir operations began, the reduced downstream flow resulted in accumulated sediments and vegetation in the river's natural, meandering channel, including changes in channel width, channel depth, and channel pattern (Everitt 1993; USIBWC 2004). After a channel is narrowed, vegetation encroachment will tend to protect the banks. Bank heights can be increased leading to channel incision or channel bed degradation and increased channel uniformity. Once channel capacity was reduced, floods from tributaries created flows that affected nearby communities, cut river meanders, and accumulated sediment and vegetation. The combined effect made it difficult to regulate the releases from upstream reservoirs to meet the downstream obligations. As a result, in June 1936, Congress authorized the construction, operation, and maintenance of the RGCP.

The USIBWC operates and maintains the channel and floodway (i.e., the area between the river channel and the levees) within the RGCP (USIBWC 2009). Maintenance includes dredging sediment out of the river channel and arroyos; leveling of the floodway; mowing of vegetation along channel banks, floodway, and levees; replacement of channel bank riprap; care of dams on arroyos; and maintenance of infrastructure such as levee roads, bridges, and dams in order to maintain hydraulic efficiency for floodwater conveyance and water distribution (USIBWC 2004).

The RGCP extends for approximately 105 miles, along the Rio Grande from the Percha Diversion Dam in Sierra County, New Mexico, to the vicinity of the American Diversion Dam in El Paso County, Texas (Figure 1). As part of the RGCP (USIBWC 2004), a deeper main channel was dredged for a length of 95 miles (153 km) to facilitate water deliveries for irrigation and other water demands. Annual channel maintenance (i.e., removal of islands, bars, arroyo plugs, and snags) still occurs (USIBWC 2017a). Associated flood control activities include clearing and leveling of approximately 3,400 ac (1,375 ha) of the floodway, diverting arroyo outlets, and constructing sediment control structures. Sections of the river bank were armored with rock revetment to reduce erosion and help maintain a consistent channel alignment. The canalization process also removed a number of meanders (Baker 1943). The RGCP includes additional features such as culverts, and drainage gates, removal and construction of bridges, building of access roads, levees over irrigation water return drains (i.e., wasteways), and placement of miles of fence and revetment to prevent erosion and to create or protect new channel banks.

Flood control levees extend for 57 miles (92 km) along the west side of the RGCP, and 74 miles (119 km) on the east side for a combined total of 131 miles (210 km) of the RGCP, nearly two-thirds of its length (USIBWC 2004). The total sediment volume moved onto levees during construction of the RGCP was nearly ten million cubic meters (Baker 1943). Naturally elevated bluffs and canyon walls contain flood flows along portions of the RGCP that do not have levees.

The levees are positioned on average about 750 to 800 ft (228.6 to 243.8 m) apart north of Mesilla Dam and 600 ft (182.9 m) apart south of Mesilla Dam. Levees were originally built to provide 3 ft (1 m) of freeboard during the design flood in most reaches, but were and are expected to be further modified in the future. Roadways are atop the levees and are generally unpaved gravel roads designed for passage of personnel and equipment. Levee maintenance includes road grading and road resurfacing with gravel as needed.

Pre-canalization channel conditions were characterized by Stotz (2000) as wide and shallow with some meanders in the stream configuration. Channel sinuosity is defined as the ratio of channel length to valley length (USBR 2011). Mack and Leeder (1998) reported that the Lower Rio Grande historically had variable width ranging from 330 to 4,265 ft (100 to 1300 m) and sinuosity (1.9 to 1.2) and displayed km of lateral migration and avulsions within a 5 miles (8 km) wide floodplain. The river now varies in width from 175 to 300 ft (53 to 91 m) with a depth of 2 to 3 ft (0.6 to 0.9 m) in the lower reaches and 7 to 10 ft (2.1 to 3.0 m) in the upper reaches with a sinuosity of 1.05. Most of the Lower Rio Grande had a sand substrate, high sediment load, and low sinuosity which predominantly resulted in a wide, sometimes but rarely braided, channel pattern. Channel pattern is the view of a river depicting the center line of a stream (e.g. see Parsons 2001, 2003). Changes to the flow and channel described previously have resulted in a current channel pattern that is a narrower, single channel that supports less native riparian vegetation than historically (Stotz 2000).

Completion of Elephant Butte and Caballo Dam caused the Rio Grande channel to degrade in the reach immediately downstream from the dam, because most of the river’s sediment load was trapped in the reservoir. Sediment-free water is released from Caballo Dam, causing some channel incision, but within a short distance, sediment-laden flows from tributaries enter the system. Further downstream, the channel began to shrink in size because the low-gradient channel could not transport this delivered load, nor the load sluiced to the channel from irrigation channels or delivered naturally from ephemeral tributaries. With no peak flows on the mainstem to wash these tributary sediments downstream, deposits or sediment plugs are formed. The USIBWC (2004) routinely removes these deposits by dredging to maintain channel capacity.

These conditions eventually led to development of several major water projects on the river. The protection of property from flood lead to the construction and maintenance of channelized rivers and levees along Lower Rio Grande, and associated loss of habitat for the flycatcher. Levees provided further flood protection, but during construction they were placed near channel at low flow, thus further restricting the active channel width during peak floods. Channelization, levees, and reduced flow imposed a single thread with relatively straight geometry on the previous meandering system.

Changes to Floodplain and Riparian Habitat

As a river channel narrows, it deepens and the adjoining floodplain is inundated less frequently, which fosters conditions favoring vegetation growth on or near the banks, and thereby reducing the width of the active channel. This vegetation encroachment is likely the result of decreased peak flows and increased low flow duration. Increased low flow duration provides water more consistently and encourages vegetation growth near the channel. Since riparian vegetation has been shown to provide geotechnical strength to the soil (Simon and Collison 2002; Pollen and Simon 2005; Pollen 2007; Pollen- Bankhead et al. 2009), it can effectively stabilize channel banks and bars (Thorne 1990; Abernethy and Rutherford, 2001; Gran and Paola 2001; Simon and Collison 2002; Griffin and Smith 2004), reduce channel-margin flow velocities and shear stresses (Carollo et al. 2002, Tal et al. 2004; Griffin et al. 2005; Tal and Paola 2007), and induce sedimentation (Tooth and Nanson 2000). As a result, channel width is often decreased. Thus, riparian vegetation can exacerbate processes of channel narrowing during low flow periods by promoting sediment deposition within the channel and on the floodplain.

Remnant cottonwood and willow, screwbean mesquite and wolfberry (*Lycium pallidum*), and saltcedar dominated vegetation now occur along the Lower Rio Grande but is fragmented and of low quality (Stotz 2000; Watts 2001). The invasion of riparian vegetation, predominantly by non-native saltcedar, has been extensive in the Lower Rio Grande and has contributed to the widespread narrowing of channels (Everitt 1993; Allred and Schmidt 1999; Graf et al. 2002). Saltcedar was introduced as an ornamental plant and as a windbreak in the Albuquerque area by 1908, and in Mesilla Park by 1910, and in El Paso by 1926 (Crawford et al. 1993; Everitt 1998).

As dam-building, flow-regulation, and channelization occurred, saltcedar became more and more dominant. The specific role of saltcedar in floodplain aggradation and channel narrowing is a matter of debate. Saltcedar was not common on the floodplain until the 1930's, after channel narrowing had begun in the Lower Rio Grande (Everitt 1998). The spread of saltcedar throughout the Lower Rio Grande may have taken place due to decreased flows and channel narrowing. Nevertheless, saltcedar may play a role in limiting the ability to reconnect the river channel with its floodplain.

Non-native plant species, including saltcedar, Russian olive, and Bermuda grass (*Cynodon dactylon*), are now found throughout the action area (Watts 2001, Moore and Ahlers 2013). Watts (2001) found saltcedar at all of her study sites and it was the dominant shrubland species 75 percent of the time. Russian olive was also introduced into the Lower Rio Grande early in the twentieth century (Crawford et al. 1993) though its spread along the desert Rio Grande has been less dramatic than that of saltcedar. Under stress, dense saltcedar patches can be prone to fire that can directly affect flycatcher habitat (Paxton et al. 2008).

River managers do not always view non-native riparian vegetation positively (Graf et al. 2002). Agencies and groups may suspect that the water transpired by the vegetation could be ''salvaged'' and used if such riparian vegetation is removed, which has given rise to removal programs (Robinson 1958; Stromberg et al. 2009). Additional pressures to remove riparian vegetation may come from flood control interests that see vegetation encroachment in and near the channel as reducing flow capacity and increasing the likelihood of flooding (USFWS 2002). In some areas of the Lower Rio Grande, riparian vegetation has been removed from streams, canals, and irrigation ditches to increase watershed yield, remove impediments to streamflow, and limit water loss through evapotranspiration (Horton and Campbell 1974; USFWS 2001, 2002). The results are that riparian habitat is often eliminated or maintained at very early successional stages not suitable as breeding habitat for flycatchers (Taylor and Littlefield 1986).

The floodway between the levees is generally level or uniformly sloped toward the channel. The floodway contains mostly grasses, some shrubs, and widely scattered trees (Watts 2001). The bank of the channel at the immediate edge of the floodway is typically vegetated with a narrow strip of brush and trees. Maintenance includes encouraging grass growth on the levee slopes for erosion control, cutting brush and tall weeds from the slopes, and repairing levee slopes. Levee slopes are mowed to prevent growth of brush and trees that could obstruct flows, or cause root damage to the structure itself.

The Lower Rio Grande and associated riparian habitat has historically been a very dynamic system in constant change and without this change, the diversity and productivity decreased. Sediment deposition, scouring flows, inundation, and irregular flows, are natural dynamic processes that occurred frequently enough in concert to shape the characteristics of the river channel, floodplain, and riparian vegetation in the action area. Flycatcher habitat has historically developed in conjunction with this dynamic system where habitat was created and destroyed at various time scales and locations. It was this type of dynamic, successional system that flycatchers depended upon for the establishment and development of breeding habitat. Through the development of dams, reduced flow, channelization, water withdrawal, and development, the dynamics of the river system have been eliminated except for localized areas such as the reservoirs where water storage levels frequently change with releases and inflows, where the river is wide and connects to the floodplain, or where riparian vegetation and flycatcher prey is maintained by seepage and high water tables.

Still Waters, Water Table, and Ground Water Interactions

The Lower Rio Grande interacts with groundwater in its alluvial sediment. These alluvial groundwater aquifers are often much wider than the stream channel and can be shaped by aquifer geology. Precipitation on the uplands can infiltrate soils, and depending on elevation and surface geology, it can contribute to the alluvial groundwater. It can also be affected by drought. Recharge to the groundwater aquifer below the Lower Rio Grande can occur from mountain-front seepage, tributary seepage, community wastewater and septic return flow, urban stormwater seepage, or irrigation seepage. Additionally, the timing, location, and rate of these exchanges between groundwater and surface water are constantly changing and are often unmeasured making specific observations limited. Groundwater pumping for agricultural, mining, industrial, and municipal uses has resulted in water table declines along many rivers and can be a major factor in the quality of flycatcher habitat (Briggs 1996; USFWS 2002). The net result of lowered water tables has been declines in river flow, with stress, injury and loss of riparian vegetation.

The effect of activities that alter groundwater can lead to the reduction (or increase) of water tables in or below riparian habitats that may support flycatchers (USFWS 2002). The floodplain of the Lower Rio Grande historically contained numerous marshes, swamps, meanders, oxbows and pools (Stotz 2000). In addition to providing evidence of channel shifting and flooding, such features also suggest a high water table within the floodplain (Graf et al. 2002). High water tables in floodplains and near river channels sustain extensive growth of riparian vegetation that provide habitat for flycatchers. These still and slow-moving waters and high water tables associated with alluvial aquifers are essential for flycatchers as they foster abundant insects necessary for breeding habitat.

Riparian Habitat Restoration

Eleven sites have been targeted for flycatcher restoration activities since 2011 (USIBWC 2017b). Over 350 ac (141.6 ha) of saltcedar have been treated and over 41,000 trees have been planted between flycatcher and cuckoo sites since 2011 (USIBWC 2017b). The Regional Sustainable

Water Project (USIBWC 2001) calls for enhancement projects along the river such as embayment habitat, sloped banks, and reseeding of native vegetation. However, the interaction of flow (its timing and magnitude), diverse river channel patterns, and connected floodplains that favor the establishment of native riparian vegetation and enhance the development of flycatcher breeding habitat will need to be further developed within the Lower Rio Grande. Management options to recreate these dynamic processes in the Lower Rio Grande, a very static river system, will require more information on the processes to manage riparian vegetation, channel patterns, operational flows, or perhaps even planned avulsions and river realignment. Processes to manipulate and operate the river and its floodplain in an attempt to restore the diversity of a functioning river ecosystem need further development.

Agricultural Development

The availability of relatively flat land, rich soils, high water tables, and water for flood irrigation has fostered agricultural development in the Lower Rio Grande. Conversion of floodplains to agricultural fields reduced the areas covered by native vegetation and certain types of vegetation were more susceptible to conversion than others. These areas often contained extensive grassland, riparian, and wetland vegetation (Stotz 2000). Agricultural development sometimes cleared riparian vegetation, or drained and protected floodplains using levees and other engineering techniques. Agricultural development can also increase the likelihood or severity of cowbird parasitism, by creating foraging sites (e.g., short-grass fields, grain storage, livestock concentrations) in proximity to breeding habitat. However, riparian vegetation that supports flycatcher habitat can also be sustained by agricultural seepage and return flows.

Human Disturbance

Human disturbance in the action area include the paintball course near the Nemexas Siphon, recreational activities near parks, and some operations and maintenance activities conducted by various staff of the USIBWC, EBID, and EPCWID (El Paso County Water Improvement District) that may occur without seasonal restrictions in or near riparian habitats. Additional human activities involving flycatcher science and research as well as flycatcher surveys also affect flycatchers (USFWS 2002). Temporary, short-term impacts to wildlife may occur from noise, dust, and the presence of workers and machinery during project construction where activities occur within flycatcher breeding season. Accidental spills of fuels, lubricants, hydraulic fluids and other petrochemicals, although unlikely, could also be harmful to aquatic insect prey or riparian habitat vigor and may affect the flycatcher.

Livestock Grazing

Overgrazing by domestic livestock has been a significant factor in the modification and loss of riparian habitats in the Southwest US (USFWS 2002). If not properly managed, livestock grazing can significantly alter plant community structure, species composition, relative abundance of species, and alter stream channel morphology (Platts and Nelson 1989, Schulz and Leininger 1990). Livestock reduce the overall density of vegetation that provides flycatcher-breeding habitat by feeding on riparian vegetation and degrade habitat through trampling vegetation or creating trails that nest predators or people use for recreation (USFWS 2002). Though rare, livestock may also physically contact and destroy nests (USFWS 2002). Fortunately, USIBWC eliminated grazing leases with the ROD in 2009 and have phased out all but one of the leases (USIBWC 2009). There has been evidence of cattle grazing reported on some areas, but not to the extent noted when grazing leases were in place.

Fire

Fire was virtually unknown in naturally functioning, riparian ecosystems of the Southwest (Busch and Smith 1993). However, fuel accumulations coupled with human-caused ignitions have introduced fire as a major disturbance mechanism in the riparian ecosystem (Stuever 2009). Vegetation accumulation on regulated, flood-suppressed rivers can cause catastrophic fires in riparian habitats (Busch 1995), with immediate and drastic changes in plant density and species composition. Riparian fires have destroyed nesting flycatcher sites along the Middle Rio Grande and elsewhere in New Mexico (USFWS 2002).

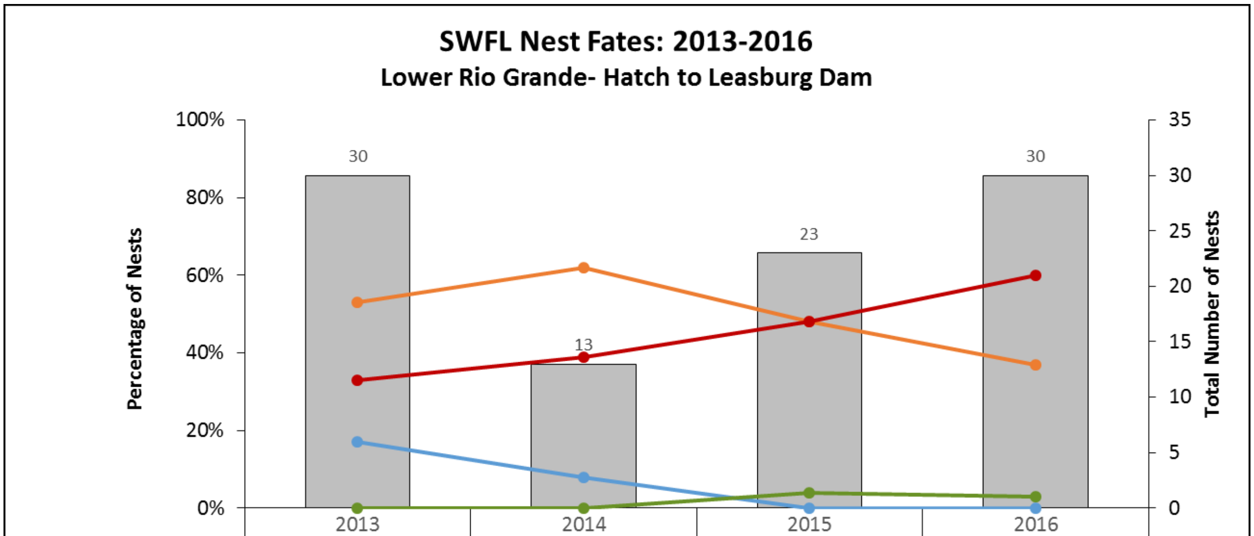
Wildfires have been an issue in the RGCP in some cases. Recently in 2013, there was a fire that burned mature cottonwoods on the NeMexas property and cut across USIBWC's property (Country Club East site) but no trees were burned on this site). Other fires have been reported from areas below Mesilla Dam and on the floodplain near the town of Hatch.

Predators, Predation, Parasites, and Disease

Flycatcher nesting success may be influenced by predation, but predation rates are within the range typical for other open-cup nesting passerine birds (Newton 1998). However, for an endangered species "normal" predation rates may exert disproportionately greater effects on the populations. Brown-headed cowbirds (*Molothrus ater*), and to a lesser extent, bronzed cowbirds (*M. aeneus*) effectively function as predators if they remove flycatcher eggs during their parasitism. Cowbirds may also remove eggs and nestlings of host species from nests (or injure nestlings in nests), thereby acting as nest predators (Beane and Alford 1990; Scott and McKinney 1994; USFWS 2002).

Since 2013, 35 flycatcher nests have been predated and eight have been parasitized by cowbirds within the action area. Results from the 2014 study included eight nests depredated and one parasitized by cowbirds (Moore and Ahlers 2015a). However, not a single instance of parasitism was recorded in the entire Lower Rio Grande study area during 2015 (Moore and Ahlers 2015b). In 2016, depredation was the primary cause of flycatcher nest failure, responsible for 11 of 12 failed nesting attempts in the lower Rio Grande (Dillon et al. 2017; Figure 4).

No parasite or disease information on flycatchers in the lower Rio Grande have been reported from observers (Moore and Ahlers 2013, 2015a, 2015b; Dillon et al. 2017).



	2013	2014	2015	2016
Number of Nests	30	13	23	30
Parasitism	17%	8%	0%	0%
Depredation	53%	62%	48%	37%
Abandonment	0%	0%	4%	3%
Nest Success	33%	39%	48%	60%

Figure 4. Flycatcher nesting variables from 2013-2016 Lower Rio Grande nests from Hatch to Leasburg Dam (Dillon et al. 2017). Percentages may sum to >100% in a given year because a single nest may be both parasitized and predated or successful.

Saltcedar Leaf Beetle

The U.S. Department of Agriculture (USDA) began actively releasing saltcedar leaf beetles in Colorado and Utah in 1999. In 2005, the biological control program was expanded to 13 states (Dudley and Bean 2012). In 2010, after concern of saltcedar leaf beetle dispersal to occupied flycatcher habitat and a lawsuit filed, all permits for saltcedar leaf beetle releases were terminated (Dudley and Bean 2012). By 2016, saltcedar leaf beetles have been confirmed in twelve states (AZ, CA, CO, ID, KS, NM, NV, OK, OR, TX, UT, and WY) and throughout the entire Action Area (Ideals-Ageiss, LLC 2016; Tamarisk Coalition 2016). On July 24, 2017 the District of Nevada found that the USDA failed to take appropriate action to mitigate the adverse effects resulting from the termination of the saltcedar leaf beetle release program (*Center for Biological Diversity v. Tom Vilsack 2017*). It is likely that USDA will be increasing conservation actions to benefit the flycatcher in the near future.

Saltcedar leaf beetle defoliation of saltcedar occurs during the summer at the time of peak breeding for many migratory bird species. By mid-summer, the beetle-infested saltcedar becomes defoliated and is no longer suitable. This results in decreased nesting success and even mortality through nest abandonment, increased nest parasitism and increased predation (Paxton et al. 2011). Beetle-infested saltcedar can take multiple years of continued defoliation to eventually result in mortality (Dudley 2005). This can result in multiple years of reduced nest success or localized extirpation.

Riparian habitat in RGCP reaches mainly consists of narrow bands of saltcedar or mixed saltcedar/coyote willow (Dillon et al. 2017). Though saltcedar is prevelant within the action area, 92% of the flycatcher territories within the action area from 2013 to 2016 have been occupying habitat dominated by native vegetation, the remaining 8% of the territories were in mixed dominated communities (Dillon et. al. 2017). In August 2016, the majority of saltcedar throughout the RGCP was showing signs of stress from saltcedar leaf beetles (moderate to severe browning and defoliation) and is likely to succumb to the saltcedar leaf beetle (Ideals-Ageiss, LLC 2016).

Breeding flycatchers within areas dominated by saltcedar may be negatively affected both in the short and long term. The rate of regeneration or restoration of native cottonwoods and willows relative to the rate of saltcedar loss will be critical in determining the effects of this large-scale ecological experiment. Without changes in water and land management, altered site conditions in the form of high salinity, lowered water tables, reduced spring flooding, and livestock grazing can continue to preclude establishment of native riparian vegetation suitable for flycatcher breeding habitat.

Drought and Climate Change
We evaluated the impacts of climate change by recognizing whether, and to what degree, climate change may affect the flycatcher and flycatcher habitat for the duration of the Proposed Action. USFWS policy (USFWS 2010) on how to view an action's contribution to climate change is through evaluation of greenhouse gas emissions associated with a proposed action, when added to the environmental baseline, along with cumulative state and private impacts that will likely contribute at least some gasses that augment tropospheric warming, and at some later time, contribute to habitat changes that may adversely affect listed species in the Action Area. The Intergovernmental Panel on Climate Change (IPCC) used models and various greenhouse gas emissions scenarios to make projections of climate change globally and for broad regions through the 21st century (Meehl et al. 2007; Randall et al. 2007; Solomon et al. 2007). The IPCC concluded: 1) it is virtually certain there will be warmer and more frequent hot days and nights over most of the earth's land areas; 2) it is very likely there will be increased frequency of heat waves over most land areas, and the frequency of heavy precipitation events will increase over most areas; and 3) it is likely that increases in extreme weather events will occur in the areas affected by droughts (Christensen et al. 2007; Prinn et al. 2011). Global climate models were downscaled to provide higher-resolution projections that are more relevant to the Action Area (see Glick et al. 2011).

A review of climatic models indicates that an increase in drying of the southwestern U.S. and northwestern Mexico will likely occur throughout this century (Seager and Vecchi 2010). Long-term climatic patterns in the southwestern U.S. regularly cause periodic droughts, but the effects of greenhouse gases will compound these events and increase their intensity (Seager and Vecchi 2010). As much as 60 percent of this drying trend in the southwestern U.S. can be attributed to anthropogenic effects (Barnett et al. 2008). One outcome is that more mountain precipitation in the winter now occurs as rain instead of snow (Barnett et al. 2008). This is causing earlier spring runoffs and shorter runoff periods from reduced snowpack (USBR 2013).

Average global surface air temperature is increasing and will continue for many decades (e.g., Meehl et al. 2007; Ruhl 2008; Church et al. 2010; Gillett et al. 2011). The overall projected air temperature trend in the Rio Grande Basin is one of increased warming compared to current conditions (Meehl et al. 2007; Glick et al. 2011; Prinn et al. 2011; Garfin et al. 2013; Pinson 2013; USBR 2013, 2016).

NMOSE (2006) listed the following impacts of climate change in New Mexico:

- Warming trends in the southwest are expected to continue to be greater than global averages by about 50 percent;
- Modeling suggests that even moderate increases in precipitation would not offset the negative impacts to the water supply caused by increased temperature;
- Increased temperatures will increase growing seasons, resulting in increased plant and human use of decreasing water supplies;
- There will likely be alterations in the arrival of snow, acceleration of spring snow melt, increased variation in the proportion of rain, all contributing to rapid and earlier seasonal runoff events; and
- The intensity, frequency, and duration of drought may increase.

Past and Present ESA Consultations in the Action Area

Within the action area, there is one past/present federal consultations which has included effects analysis for the flycatcher. The 2012 USFWS Biological Opinion on the effects of the USIBWC's Integrated Land Management Alternative for Long-Term Management (Land Management Alternative) of the RGCP in Sierra County and Doña Ana County, New Mexico, and El Paso County, Texas. This BO is the reinitiation of the 2012 consultation with updated flycatcher effects analysis is included herein.

EFFECTS OF THE ACTION

Regulations implementing the ESA (50 FR 402.02) define the effects of the action as the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, which will be added to the environmental baseline. Indirect effects are those that are caused by the proposed action and are later in time, but are still reasonably certain to occur. Interrelated actions are those that are part of a larger action and depend on the larger action for their justification; interdependent actions are those that have no independent utility apart from the proposed action. Effects of the action are considered along with the environmental baseline and the predicted cumulative effects to determine the overall effects to the species for purposes of preparing a BO on the proposed action (50 CFR §402.02).

For the purposes of this analysis, "suitable habitat" is referring to areas mapped either in 2012 or 2016 and determined to be of moderate to highly suitable habitat for flycatchers and composed of vegetation with the structure and density of vegetation to accommodate nesting activity. "Suitable habitat" contains the PBFs. "Territories" are individual flycatchers, pairs or pairs with nests that remain defending a home range over the duration of the breeding season.

Levee Maintenance Activities

There are no direct affects associated with the proposed levee maintenance activities; however, there are indirect affects to flycatchers due to noise disturbance. Levee maintenance activities include mowing shrubs and woody vegetation on the levee, repairing levee slope and grading and resurfacing roads along levees. These activities would occur the entire length of the project area from Percha Dam to American Dam (105.4 miles). Mowing activities are expected to remove vegetation on the levee itself, and would consist of upland vegetation lacking historic territories and PBF's. When mowing occurs, it is anticipated to generate an abundance of noise via mowing equipment traffic and the act of mowing itself. The abundance of noise generated would be expected to decrease the ability for flycatchers to effectively communicate with each other for attracting a mate, warning of danger, or other necessary communications. The reduction in communication could lead to less pairing and nesting activity, or decreased nest success in raising offspring. Indirect effects associated with noise disturbance are expected to be offset by the proposed BMP's included in the BA and the Flycatcher Management Plan (USIBWC 2016, 2017a), such as:

- Establish a 0.25 mile buffer around observed territories where USIBWC will not mow;
- No work within 0.25 mile of flycatcher territories will be conducted from May 15-August 15;
- If work must be conducted during the breeding season, no work will be conducted prior to 9 am, work will be reduced to shortest time frame possible to minimize impacts, and noise will be kept to a minimum;
- All USIBWC licenses, permits and leases will be reviewed for potential impacts to flycatchers; and
- If an unanticipated action not covered under the RMP would impact flycatchers, consultation via email with NMESFO would take place.

Construction and Rehabilitation
Proposed construction and rehabilitation activities are expected to indirectly affect flycatchers due to noise disturbance. No direct affects are anticipated. Activities associated with construction and rehabilitation includes: levee improvements, drain structure rehabilitation and/or replacement, and levee/floodwall construction. Similar to the levee maintenance section above, the construction traffic and movement of dirt, rip rap, culverts or other material is expected to generate an abundance of noise disturbance. Indirect effects associated with noise disturbance are expected to be offset by the proposed BMP's included in the BA and the Flycatcher Management Plan (USIBWC 2016, 2017a) and referenced in the Levee Maintenance Activities section above. In addition to the offsetting measures, the indirect effects will be offset by the fact that construction and rehabilitation will take place in reaches lacking any flycatcher territories and less than 4 acres (1.6 ha) of moderate to highly suitable habitat located within the reach (i.e. Courchesne, Nemexas, and Canutillo Reaches). Given that flycatcher habitat patches are typically 4.5 acres (1.8 ha) in extent (USFWS 2002), it is not anticipated that flycatchers will establish breeding territories within reaches where construction and rehabilitation will occur.

Channel Maintenance
This action includes sediment removal at islands (including areas along the banks of the river, arroyos, or gage stations) which are devoid of vegetation. This action also includes non-sediment removal such as construction of sediment traps at arroyos, vortex weir modification; low-elevation spur dike construction; or adding rip rap, gravel, or planting vegetation for stabilizing banks. In addition, other activities such as vegetation removal at islands and along banks will occur.

No direct effects are anticipated as a result of the channel maintenance activities. Indirect effects that will adversely affect flycatchers are anticipated to occur from channel maintenance activities where removal of occupied and/or suitable habitat will occur. Vegetation or bank destabilization activities are proposed to occur within 0.25 miles of nine historic flycatcher territories. This includes the removal of an estimated 51.07 ac (20.67 ha) of suitable flycatcher breeding habitat (USIBWC 2017a). Vegetation or bank destabilization will occur when flycatchers have migrated out of the area, however indirectly, the removal of vegetation will cause flycatchers to relocate breeding activity upon arrival from migration the following spring. This relocation is anticipated to cause flycatchers to alter site fidelity instincts and put forth additional energy in attempting to attract a mate in alternative habitat. If successful in attracting a mate, the alternative habitat selected could be less suitable than the removed habitat as there would be up to 51.07 ac less than the current 244 ac (98.74 ha) of suitable breeding habitat available for flycatchers to select from. Flycatchers selecting less suitable habitat could decrease nest success, thus minimizing the total number of offspring in a given breeding season by an unknown amount. It is important to note however, that the trend has been a population increase of 19% to 32% in recent years, with 33% to 60% nest success (Dillon et al. 2017). Though up to nine territories may be displaced in every 5-year interval (27 over the duration of this consultation), the overall population is likely to make up for that loss with annual offspring. From 2013 to 2016, 132 total territories produced at least 96 nests (with known outcomes) within the action area and produced a total of 122 young (Dillon et al. 2017).

Vegetation or bank destabilization activities as proposed will reduce the meandering effects of the Lower Rio Grande, and basically keep the river moving straighter, faster and more efficiently for water delivery (USIBWC 2017a). The impacts this would have to the quantity of territories or acreage of suitable habitat is unknown, but generally, this will decrease the opportunity for successional age classes of vegetation to generate. Successional age classes and dynamic riverine features that allow for meandering and overbank flows are essential to create flycatcher habitat and attract individuals for generating offspring. Habitat restoration as proposed will offset the effect of channel maintenance by constructing sites that aim to either raise the water table; restore overbank flooding by bank lowering; or add natural levee breeches, secondary channels, bank destabilization, and construction of inset floodplains.

In the current RMP Part 4 (USIBWC 2016), one modification of an arroyo inlet project (Garcia Arroyo) is located within 0.25 miles of three historic flycatcher territories. Sediment trap features will be constructed with rebar and wire screens, which may require vegetation removal to tie these features into the bankline. This would anchor them in a way to avoid blow out in a high flow scenario and instead trap sediment and debris at the feature site. Indirect effects such as noise disturbance are anticipated during construction, but offset by proposed BMP's that will avoid construction activities from May 15 to September 1. Vegetation removal will alter occupied habitat patches upstream and downstream of the construction site and in close proximity to historically occupied habitat. In 2016, three total territories occupied habitat patches directly upstream and downstream of Garcia Arroyo, however, these same territories would also be impacted by vegetation or bank destabilization activities as described above.

Channel maintenance activities are anticipated to be ongoing and have been analyzed for impacts for the duration of this BO. The RMP (USIBWC 2016) has identified specific locations for channel maintenance activities to occur within a 5-year timeframe which is due to be complete in 2019. Upon revision of the RMP, it is anticipated that similar impacts would occur to flycatchers and flycatcher breeding habitat in 5-year intervals as channel maintenance priorities in various flycatcher occupied reaches are determined. With the assumption of similar impacts due to occur, it is anticipated that up to 51.07 ac would be lost and nine flycatcher territories would be displaced every 5-year period due to channel maintenance activities.

Floodway Vegetation Management
There are no direct effects to the flycatcher associated with floodway vegetation management activities. Indirectly, the proposed widening of non-mowed areas, as well as restoration and water acquisition activities, are anticipated to benefit the flycatcher. Floodway vegetation management includes: mowing of 2,674 ac of floodway within the project area; implementation of 30 habitat restoration sites on 553 ac (of which, 11 sites and 89.8 to 129.8 ac (36.3 to 52.5 ha) are targeting flycatcher breeding habitat restoration specifically); framework design and implementation of a water transaction program; and, removal of invasive vegetation from "No Mow" areas through alternative means (i.e. herbicide).

Mowing activities significantly reduce the amount of vegetation present within the floodway, however, mowed areas are largely composed of sparse non-native vegetation and provide minimal (if any) habitat suitable for flycatcher breeding habitat. Typically a 15-ft (4.6 m) "fringe" of vegetation remains along the bankline and is an area not mowed (USIBWC 2017a). These "fringe" areas consist of primarily coyote willow along the river bank or islands within the river channel itself. The habitat within the "fringe" and islands are the areas where historic flycatcher territories have occurred. The adaptive management proposal to widen the "fringe" habitat to 35 ft is anticipated to either increase the amount of suitable habitat available for the species, or at the very least, provide additional concealment from predators.

Within USIBWC restoration sites, approximately 41,323 trees and 1,062 longstem shrubs have been planted and 385 acres (155.8 ha) of saltcedar have been treated or excavated amongst 30 restoration sites, of which 11 target flycatcher breeding habitat specifically (USIBWC 2017b). As proposed, the goal of restoration sites is to target at least 89.8 ac of flycatcher habitat as planted trees mature and fill in. The timeframe for restoration sites to reach suitability for flycatcher breeding activity is largely dependent on hydrological conditions. However, coupled with the water transaction program, hydrological conditions are more secure in that USIBWC is able to use already acquired water rights to supplement the hydrological need of vegetation within restoration sites. To date, USIBWC has acquired 5.6 ac (16.9 ac/ft) of EBID surface water rights and is working on acquiring an additional 41.75 ac (126 ac/ft) of water rights. The ROD committed the USIBWC to acquiring or leasing 450 ac/ft annually (USIBWC 2017b). The baseline conditions include 244 ac of suitable flycatcher habitat identified in 2016 which supports 50 territories (USIBWC 2017b).

Summary
The Proposed Action is anticipated to harm, through the indirect effects associated with removal of occupied and/or suitable habitat, up to nine territories and 51.07 ac of suitable breeding habitat within 5-year intervals (or 27 territories and 153.21 ac (62.0 ha) of suitable habitat over the 15-year duration of this consultation). These territories are anticipated to be displaced as a result of the Proposed Action, though adjacent suitable habitat for flycatchers to establish new territory locations does not appear to be a limiting factor even with 51.07 ac removed every 5 years. Habitat restoration, water right acquisition, and extended "No Mow" areas, is anticipated to increase habitat or maintain the existing 244 ac of habitat availability for flycatchers from baseline conditions and offset the 51.07 ac removed every 5 years. On average, flycatcher

territories are 4.5 ac (USFWS 2002), so the loss of 51.07 ac from the current 244 ac would still provide enough habitat to support the current population which is surpassing recovery goals.

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this BO. 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.

Saltcedar Removal

With the recent saltcedar leaf beetle impacts to saltcedar, it is anticipated that landowners will increasingly be removing saltcedar from their property. This activity will minimize fire risk, but decrease the amount of woody vegetation within the floodway. Flycatchers observed within the action area have been primarily located in native stands of vegetation, but may use exotic vegetation for foraging areas during migration.

CONCLUSION

This BO relies on the revised regulatory definition of "*destruction or adverse modification*" of designated or proposed critical habitat from 50 CFR § 402.02. As of February 11, 2016, the definition of "*destruction or adverse modification*" has been revised to align it with the conservation purposes of the Endangered Species Act of 1976, as amended, and the ESA's definition of "critical habitat" (81 FR 7214). Specifically the rule states: "Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat for the conservation of a listed species. Such alterations may include, but are not limited to, those that alter the physical or biological features essential to the conservation of a species or that preclude or significantly delay development of such features." The revised definition continues to focus on the role that critical habitat plays for the conservation of listed species and acknowledges that the development of physical and biological features may be necessary to enable the critical habitat to support the species recovery.

"*Jeopardize the continued existence of*" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR §402.02).

"*Recovery*" means improvement in the status of listed species to the point at which listing is no longer appropriate under the criteria set out in section 4(a)(1) of the ESA (50 CFR §402.02).

After reviewing the current status of the flycatcher, the environmental baseline for the action area, the effects of the Proposed Action and the cumulative effects, it is the USFWS's opinion that the Proposed Action, is not likely to jeopardize the continued existence of the flycatcher. Critical habitat for this species has been designated throughout the southwest but is not included in the action area. This action does not affect critical habitat outside the action area and no destruction or adverse modification of that critical habitat is anticipated.

The recovery goal for the Lower Rio Grande Management Unit is 25 territories, and this goal has been surpassed since 2012 (Dillon et al. 2017). Suitable habitat has also increased since 2012, from an estimated 201.6 ac to 244 ac, even with extensive drought conditions from 2012 to 2014 (Dillon et al. 2017; USIBWC 2017b). Since 2012, nest success has varied from 33% to 60%, and the population has displayed growth in recent years even with the drought conditions experienced from 2012 to 2014 (Figure 3) (Dillon et al. 2017).

The Proposed Action is anticipated to indirectly affect up to nine territories and 51.07 ac of habitat within 5-year intervals. These territories are anticipated to be displaced as a result of the Proposed Action, though adjacent suitable habitat for flycatchers to establish new territory locations does not appear to be a limiting factor even with 51.07 ac removed. On average, flycatcher territories are 4.5 ac (USFWS 2002), so the loss of 51.07 ac from the current 244 ac would still provide enough suitable habitat to support the current population surpassing recovery goals. In future years, the saltcedar leaf beetle is still anticipated to be a main threat in the project area. However, 92.7% of all territories from 2013 to 2016 have been located in native dominated stands of vegetation which would not be as affected by beetle defoliation impacts as the territories would be if they were instead located in mixed or exotic dominated stands. In addition, habitat restoration, water right acquisition, and extended "No Mow" areas, is anticipated to increase habitat availability for flycatchers from baseline conditions. We therefore conclude that implementation of the Proposed Action will not preclude the recovery of the species.

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

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined (50 CFR §17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined (50 CFR §17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

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

AMOUNT OR EXTENT OF TAKE

The USFWS anticipates nine flycatcher territories and 51.07ac of suitable and/or occupied habitat will be taken in 5-year intervals for the 15-year duration of this consultation as a result of this Proposed Action. The incidental take is expected to be in the form of harm via removal of suitable and/or occupied habitat in the non-breeding season resulting in displacement upon arrival back to the breeding range in the summer months.

EFFECT OF THE TAKE

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

REASONABLE AND PRUDENT MEASURES

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

1. In 5-year intervals assess the amount of suitable flycatcher breeding habitat available within the project area and ensure habitat is not a limiting factor for supporting the population. Use adaptive management to supplement, add to, or maintain suitable breeding habitat.
2. Implement the Flycatcher Management Plan to minimize disturbance and manage habitat.

Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the USIBWC must comply with the following terms and conditions. These terms and conditions implement the RPMs listed above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

To implement RPM 1, USIBWC shall:

1.1 Continue to implement proposed restoration sites targeting the creation of suitable flycatcher breeding habitat, including the following sites: Trujillo, Jaralosa, Yeso West, Crow Canyon B, Crow Canyon C, Rincon Siphon, Broad Canyon Arroyo, Selden Point Bar, Leasburg Extension Lateral WW8, Mesilla East, Berino West, Berino East, and Sunland Park. Should any of these sites change, new restoration sites shall be evenly distributed throughout the action area and target the same amount of flycatcher habitat. Proposed revisions to restoration sites shall be reviewed by the NMESFO prior to implementation.

1.2 Any vegetated islands that are proposed for removal and are occupied by breeding listed species must be relocated. Willows and cottonwoods shall be cut so that whips can be used within restoration sites. The remaining stumps, roots, and top layer of sediment shall be transplanted to adjacent shoreline to create a lower terrace of habitat which could transition to suitable flycatcher breeding habitat over time.

1.3 Restoration sites proposed with the goal of targeting suitable flycatcher breeding habitat that are receiving or are targeted to receive irrigation water from USIBWC water rights shall receive water at the discretion and prioritization of USIBWC. In water shortage years, USIBWC will prioritize restoration sites with targeted suitable flycatcher breeding habitat by distributing water to sites that are either 1) occupied; 2) need the least amount of water to benefit the most amount of habitat; or 3) are in greatest need for water to ensure the continued survival of vegetation.

1.4 Continue incorporating opportunities to improve the quality of suitable flycatcher breeding habitat via purchasing or leasing of water right or private property, as feasible, (as committed in USIBWC's ROD) or alternative sources of supplemental water. Incorporate management opportunities for overbank flows, river realignment, increased area for lower terraces along the bankline, or other management techniques to increase area available for suitable flycatcher breeding habitat.

1.5 At least once every 5-years, USIBWC will quantify the amount of dense, riparian shrub habitat that is suitable for flycatcher breeding activity within the project area, using field verified methods of quantification and provide that information (including all reports, shapefiles, or other quantification related documents) to the NMESFO. This inventory shall then be used to determine if habitat was lost or gained over the 5-year period and ensure that no more than 51.07 acres of suitable flycatcher breeding habitat was removed as a result of the Proposed Action.

1.6 The 5-year field verified method of quantification shall also be used to determine the amount of suitable flycatcher breeding habitat available within the project area. Adaptively manage as appropriate to ensure that habitat is not a limiting factor in continuing to reach and surpass recovery goals for the USFWS Lower Rio Grande Management Unit. Habitat throughout the USIBWC property within RGCP shall be supported: a) naturally; b) by the restoration sites as proposed; c) by redistributing vegetated islands to new locations; d) by extending area/width associated with bankline terraces; or, e) by working with partners to enhance other restoration projects.

RPM 2 Implement the Flycatcher Management Plan to minimize disturbance and manage habitat.

2.1 Revise part 3 (USIBWC 2016) - Endangered Species Management Plan as appropriate, including management for other applicable species, incorporating RPM's and terms and conditions, information from Recovery Plans, and, where possible, conservation recommendations listed below. As new data becomes available, coordinate with the NMESFO to revise proposed BMP's, typical mitigation measures, or restoration sites, as appropriate for the betterment of the flycatcher.

2.2 Coordinate with maintenance crews prior to and during the breeding season (May 15 to August 15) to ensure their awareness of the most current status, breeding locations, and conservation measures proposed to minimize impacts to flycatchers (or other sensitive species).

2.3 Continue implementation of "No Mow" areas which have established buffers around flycatcher nesting areas.

2.4 Complete annual presence/absence surveys for endangered/threatened species wherever suitable breeding habitat exists within project area in order to track status, identify sensitive locations, and determine whether or not additional conservation would be necessary.

2.5 Annually report restoration activities and evaluate where restoration is providing suitable habitat to accommodate flycatcher breeding activity. If sites must be abandoned, find alternative locations at no greater than 40 mile intervals so that suitable flycatcher breeding habitat is available evenly throughout the action area. Restoration is considered to be "suitable" when canopy cover is at least 50%, vegetation height is at least 9 ft (3 m), and patch width is at least 30 ft (10 m) (Moore and Ahlers 2013).

2.6 Include the best available science, partner with stakeholders, agencies, and the public to learn and share information about riparian habitat restoration, flycatcher habitat use and flycatcher habitat optimization and monitoring in the Lower Rio Grande.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize incidental take that might otherwise result from the Proposed Action. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures provided. The USIBWC must immediately provide an explanation of the causes of the taking and review with the NMESFO the need for possible modification of the reasonable and prudent measures. Annual reporting of the RPMs and terms and conditions are to be reported to the NMESFO by March 31st.

CONSERVATION RECOMMENDATIONS

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

a) Apply adaptive management to address areas that are not rendering as successful as anticipated. Modify in coordination with the USFWS as needed to reach the proposed goal of 89.8 ac for restoration;
b) Relocate vegetation and island sediment from vegetated islands greater than 0.25 ac using methods described in RPM 1.2;

c) Monitor flycatcher nests to track nest success and overall population status. Addling or removal of brown-headed cowbird eggs from parasitized flycatcher nests is recommended whenever it can be done with minimal disturbance;
d) Encourage adaptive management of flows and conservation of water to benefit flycatcher and yellow-billed cuckoo habitat in the Lower Rio Grande;
e) Allow river meanders or other means of incorporating water onto the floodway wherever possible;
f) Monitor ground water levels near restoration sites as necessary; and
g) Work with federal agencies seeking to remove saltcedar and assist with follow-up restoration wherever possible.

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

REINITIATION NOTICE

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

The USFWS appreciates the USIBWC's efforts to identify and minimize effects to listed species from this project. For further information please contact Vicky Ryan of my staff at (505) 761-4738. Please refer to the Consultation # 02ENNM00-2017-F-0367 in future correspondence concerning this project.

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