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Fish and Wildlife Service
Arizona Ecological Services Office
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In reply refer to:

AESO/SE
02EAAZZ00-2015-F-0151-R1

September 19, 2016

Ms. Sallie Diebolt, Chief
Arizona Branch, Regulatory Division
Los Angeles District, Army Corps of Engineers
3636 North Central Avenue, Suite 900
Phoenix, Arizona 85012-1939

RE: Reinitiation of Consultation for the Upper Gila River Vegetation Management Project

Dear Ms. Diebolt:

Thank you for your request for reinitiation of formal consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (ESA). Your request was dated January 28, 2016. At issue are impacts that may result from an expansion in scope for the proposed Upper Gila River Vegetation Management Project located in Graham County, Arizona. You concluded that the proposed action "may affect, is likely to adversely affect" the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) (SWFL) and its critical habitat, and the threatened western yellow-billed cuckoo (*Coccyzus americanus*) (WYBC) and its proposed critical habitat.

In your letter, you also determined the proposed project would not affect the endangered razorback sucker (*Xyrauchen texanus*) but "may affect, not likely to adversely affect" its critical habitat. We remain in concurrence with your determinations based upon rationale provided in Appendix A of our February 6, 2015 Biological Opinion. This reinitiation addresses an expansion of the original project area from approximately 54 acres, to approximately 411 acres. However, all other components of the proposed action remain the same. It should be noted that many of the proposed 411 acres are dominated by native species and would only receive selective removal of tamarisk, rendering a much smaller net increase in affected area. Therefore, the basis for our concurrence of your determinations regarding the razorback sucker and its critical habitat, as provided in Appendix A of our February 6, 2015 Biological Opinion remains valid and is incorporated herein. Thus, we will not discuss the razorback sucker further in this analysis.

This biological opinion and conference opinion is based on information provided in the November 2014 Biological Assessment, the 2014 Riparian Restoration Framework for the Upper Gila River in Arizona (Orr *et al*. 2014), the 2015 Project Progress and Monitoring Report and Addendum to the Biological Assessment for the Gila River Restoration Project, telephone conversations, electronic communications, and other sources of information. Literature cited in this biological and conference opinion is not a complete bibliography of all literature available on the species of concern, vegetation management activities including nonnative vegetation removal and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office.

CONSULTATION HISTORY

April 15, 2014: Technical assistance meeting with Gila Watershed Partnership (GWP), USFWS, Walton Family Foundation (WFF), and others to discuss ESA permitting approaches for the project. A research and recovery, 10(a)(1)(A) permit was discussed as one option.

July 28, 2014: Technical assistance meeting with GWP, US Army Corps of Engineers (USACE), USFWS, WFF, and others to discuss the project, potential vegetation management sites, permitting approaches, and project timeline. At this meeting, it was determined that because a Section 404 permit would be needed for the project, ESA permitting could be more readily accomplished via Section 7 consultation.

September .17, 2014: Technical assistance meeting with GWP, USFWS, WFF, and others to discuss the project, permitting requirements, and permitting timeline. At this meeting, it was determined that the extent of vegetation management to be included in the permit applications would be limited to the approximately 50 acres planned for the five-year permit term to streamline USACE and USFWS review and consultation, and facilitate permit acquisition by December 2014/January 2015.

November 20, 2014: Technical assistance conference call with GWP, USFWS, and others to discuss and identify vegetation management site work area extents that would maximize the amount of vegetation management that could occur while minimizing potential impacts to SWFL nests.

December 2, 2014: Biological Assessment received from the USACE.

December 11, 2014: Technical assistance conference call with GWP, USWFS, and USACE to discuss the determinations in the Biological Assessment.

December 12, 2014: Email received from the USACE changing their effects determination for the WYBC. The determination in the November 2014 Biological Assessment for the WYBC was that the proposed project may affect, but

	is not likely to adversely affect, WYBC or its proposed critical habitat. The email received on December 12, 2014 from the USACE changed their effects determination for the WYBC to may affect, likely to adversely affect for the species and its proposed critical habitat.
January 14, 2015:	Phone call from USACE stating they did not want to receive a draft biological opinion. Due to the GWP request to start work immediately the USACE requests that a draft biological opinion not be provided.
December 31, 2015:	Project Progress and Monitoring Report received from the Gila Watershed Partnership of Arizona.
Feb 6, 2015:	Biological opinion (BO) issued for the original project (AESO/SE 02EAAZZ00-2015-F-0151)
Aug 10, 2015:	Technical assistance meeting with GWP, USFWS, and others to discuss modifications to the project description and approaches to reinitiating consulting under the ESA. It was concluded that consultation could be reinitiated based on an amendment to the BA, and the content of the amendment was discussed.
January 28, 2016:	Correspondence received from the USACE requesting reinitiation of formal consultation, which included the 2015 Addendum to the Biological Assessment for the Gila River Restoration Project (BA Addendum).
March 14, 2016:	Correspondence sent to USACE requesting additional information before reinitiation of consultation.
July 14, 2016:	Correspondence received from the USACE providing additional information we requested.
September 14, 2016:	Conference call held with individual representing GWP, Stillwater Sciences (consultant), Northern Arizona University (contractor), USACE, and USFWS. During the call, project proponents agreed to provide language changing the conservation measure that requires buffering (90 feet) SWFL nests from project activities to instead, buffering territories as well as nests, provide an additional conservation measure that requires a mid-point project evaluation of project results to inform future management and project implementation, and provide SWFL territory data collected from previous surveys for incorporation into the reinitiated BO.

BIOLOGICAL AND CONFERENCE OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed project expands upon five discrete vegetation management sites along the upper Gila River in the vicinity of the communities of Pima and Fort Thomas in Graham County, Arizona; these vegetation management sites run approximately parallel to U.S. Highway 70 (Hwy 70) (Figure 1). The addition of three vegetation management sites (R4, R9/10, and R15) and the expansion of the original vegetation management sites, increases the project area from 54.3 acres to 410.09 acres (which includes 291.9 and 355.0 acres of SWFL and WYBC habitat, respectively). The vegetation management sites were identified by GWP and their vegetation management planning science team as part of a comprehensive ecohydrological assessment that evaluated vegetation management suitability throughout a 53-mile stretch of the Gila River corridor from the Gila Box east of Solomon (at the Bonita Creek confluence) downstream to the eastern boundary of the San Carlos Apache Reservation near Geronimo (Orr *et al.* 2014). This process entailed consideration of numerous environmental factors including flood-scour risk, vegetation character, groundwater and soil-moisture availability, soil salinity, and SWFL-nesting habitat suitability. The eight vegetation management sites (which retain the numbering system used in the ecohydrological assessment) are R3, R4, R8, R9/10, R11, R14, R15 and R18, will now range in size from 9.3 to 114.5 acres, and total 410.9 acres. The modified overall project area of 410.9 acres will allow the GWP to achieve their overarching target of 200 acres of tamarisk removal and habitat enhancement in the Safford Valley (i.e. 200 acres managed within a 410.9 acre project area), while accounting for the sometimes sizable stands of existing native vegetation at the management sites. These remnant stands will not be removed, in addition to nest buffer areas, which will not be treated when active. The vicinity of the project's vegetation management sites as well as each individual site are mapped in Figures A1 through A8 in Appendix A.

The action area is defined as those areas influenced by direct and indirect effects of the proposed action (USFWS 1998a). The project action area includes the area affected by both the actions authorized by the USACE Section 404 permit as well as all interrelated and interdependent actions at the eight project vegetation management sites. As such, the action area encompasses all eight of the vegetation management sites, access routes to the vegetation management sites, proposed staging areas, and proposed cutting collection areas. The vegetation management sites are linked by and would be accessed from existing paved and unpaved roads, such as River Road, Bryce-Eden Road, North Main Street in Pima, Hwy 70, and maintained agricultural field roads. These roads would require no modifications by the project and are, therefore, not included in the action area.

Activities analyzed include those potentially subject to authorization by the USACE Section 404 permit as well as all interrelated and interdependent actions at the eight vegetation management sites. These activities will occur over an estimated period of five years, beginning at the time of 404 permit acquisition.

The long-term ecological goals and actions of the project are to:

1. Focus tamarisk control efforts on sites where: (a) normal river flooding processes are less likely to naturally remove tamarisk as identified in the ecohydrologic assessment (Orr et al. 2014), (b) private property and high-value vegetation (e.g., cottonwood groves) could be damaged by wildfire, and/or (c) landowners are in agreement with approaches to reestablish native vegetation.

2. Conduct active tamarisk control and revegetation projects at enough sites and of sufficient size to develop riparian habitat resiliency to the anticipated arrival of the tamarisk leaf beetle, and contribute to the recovery of SWFL and western yellow-billed cuckoo (WYBC; *Coccyzus americanus*), and conservation of other native riparian obligate wildlife species.

3. These sites, known as propagule islands, will accelerate reestablishment of native plant coverage *and* provide additional native seed sources that are critical for reestablishing native riparian plants through natural recruitment processes, such as during flood events.

4. These sites will also provide a test of a strategy for treatment and revegetation where tamarisk beetle have defoliated existing tamarisk.

5. Augment native plant species recruitment by providing plant materials suitable for the Upper Gila Watershed from the GWP native plant nursery, which is composed of a greenhouse, shade structure, plantation fields, and coppice fields.

6. Increase native riparian plant communities by reducing the relative canopy cover of tamarisk to less than 10 percent at selected treatment areas through active control measures and through the expected establishment of the tamarisk leaf beetle.

7. Reduce the relative canopy cover of other invasive plant species to less than 15 percent at selected treatment areas.

8. Where possible, reduce stressors beyond invasive species to the river system, namely water quality degradation and grazing pressure.

9. Assess and track success of vegetation management actions and methods through the development and implementation of rapid and long-term monitoring protocols.

Vegetation Management Sites

Vegetation management sites are depicted in Figures A1 through A8 in Appendix A, and the activities that would occur at each site are described generally in Attachment A-3, Table 1 of the BA Addendum and are incorporated here. Additional details of the proposed actions to be implemented at each vegetation management site are provided below.

Nonnative Vegetation removal

One of the objectives of the project is to reduce and minimize impacts to the SWFL and WYBC from the anticipated arrival of the tamarisk leaf beetle (*Diorhabda sp.*), and subsequent tamarisk defoliation and mortality, in the upper Gila River valley. In the short-term, manual tamarisk removal will be necessary at high-priority sites to provide sufficient space for native tree revegetation. Because of the site-specific evaluation that identified landscape features that allow these native tree species to become established, grow, and persist, it is the intention that these management sites will return to SWFL nesting habitat and buffer the impacts expected by the leaf beetle.

The methods used by the project to treat tamarisk are summarized in Table 2 and are described in greater detail below.

Table 1. Summary of tamarisk removal methods.

Vegetation management site condition	Tamarisk removal methods
Current conditions	Tamarisk would be removed from the vegetation management sites, avoiding native vegetation and SWFL nest buffers, using a mechanized brush mulcher or hand tools, and follow-up herbicide application to prevent resprouting.
Post-wildfire	Burned tamarisk plants would be removed to facilitate access and any re-sprouts would be treated with herbicide application. None of the vegetation management sites proposed have been recently burned by wildfire. Prescribed fire is not part of the proposed action. This condition is included in the proposed action to facilitate rapid revegetation and re-sprout treatment should a wildfire occur within the eight identified vegetation management sites. Since a wildfire would destroy any potential SFWL or WYBC habitat in the burned area, post-burn revegetation and re-sprout treatment could be conducted over a longer period of time.

Tamarisk biomass removal will be accomplished primarily by cutting and/or mulching the above-ground portions of the shrubs/trees and then immediately applying an herbicide to the cut stumps. Tamarisk trees will be cut as close to the ground as possible using primarily a small excavator (10-ton class) equipped with a mulching head attachment (e.g., Torrent EX30 Brush Cutter), but also chainsaws, loppers, and hand saws where access is limited. These methods will allow for the effective removal of both dense, monotypic stands of tamarisk as well as tamarisk trees that may be interspersed with desirable native tree and shrub species that need to be conserved. Excavation will not be used to remove tamarisk at the root, to minimize ground disturbance and secondary weed colonization.

Another highly invasive plant present in the upper Gila River valley, albeit in relatively low numbers, is giant reed (*Arundo donax*). This species will be removed wherever encountered using the cut-stump treatment approach described below.

The mulched tamarisk material (i.e., wood chips) will be left on-site to help retain soil moisture and to further hinder recruitment of nonnative weeds.

Hand-cut debris will be relocated outside of the ordinary high water mark on bare soil and reduced by means of mulching or burning. Burning of debris piles, if implemented, will be overseen by professional crews when air, moisture, and wind conditions are appropriate. Local fire departments are anticipated to perform these burns as training exercises. All local and/or state air quality permits will be obtained prior to any burn actions occurring.

Cut tamarisk stumps will be immediately treated with herbicide, and tamarisk re-sprouts will be treated with foliar and/or cut-stump herbicide applications. Herbicides to be used include triclopyr (trade names include Garlon and Element), imazapyr (trade names include Arsenal, Habitat, Stalker, Chopper, and Polaris), and perhaps glyphosate (trade names include Roundup, Rodeo, and Aquamaster). Solutions of these herbicides, at the concentrations and rates suggested for tamarisk would be applied to cut tamarisk stumps, or basal bark by hand "painting", or to re-sprouting stems by backpack sprayer. When working within 20 feet of the Gila River and other aquatic habitats, triclopyr will only be applied by hand "painting" (backpack sprayers will not be used). Herbicide solutions will be mixed with a color dye to determine which trees have been treated and reduce potential for overspray. Generally, herbicide will be applied until the cut tamarisk surface is thoroughly wet but not to the point of runoff to reduce damaging or killing non-target species. Application of herbicide will be closely supervised and one certified applicator will be on site at all times. The project will obtain and comply with the conditions of a Pesticide General Permit from the Arizona Department of Environmental Quality (ADEQ). Per the USFWS (2007) *Recommended Protection Measures for Pesticide Applications in Region 2 of the U.S. Fish and Wildlife Service*, pesticides will not be mixed, stored, or handled near sensitive areas. Excess pesticide and empty pesticide containers will not be allowed to remain near species habitat or waterbodies and will be discarded at authorized landfills or other appropriate sites. Application equipment will be well-maintained and checked periodically for leaks, worn parts, and calibration.

A 90-ft nest buffer will be installed around every known SWFL nest site. The buffer distance was developed by the GWP and for the vegetation management sites. The buffer distance was based on what GWP thought could be implemented and was not based on any specific known biological characteristics of known SWFL nesting sites. A qualified biologist will identify areas to be avoided during project activities, consider the locations of occupied SWFL nests (as determined by the SWFL survey results from the previous breeding season), patch size, and the vegetation composition, density, distribution, canopy closure, structure, and soil moisture around the nest, along with the amount of surrounding tamarisk that is removed, to identify buffer areas and shapes. The use of site conditions around the nest to identify buffer areas will likely result in SWFL nest buffers that are greater than 90 ft in some areas and irregularly shaped, rather than circular. This approach provides a balance between minimizing short-term construction-related

impacts to SFWL and carrying out the project's long-term beneficial vegetation management activities as cost efficiently and successfully as possible.

Tamarisk removal in the vegetation management sites will occur between October 1 and April 14, to completely avoid the combined SWFL and WYBC breeding seasons (April 15 to September 30) and impacts on breeding birds. Tamarisk re-sprout treatment in post-wildfire areas, where SWFL breeding habitat does not exist, could occur outside of this period, although the October 1–April 14 work period also allows for the greatest amount of herbicide translocation to below-ground tissues, and is most suitable for crew safety as it relates to lower air temperatures to prevent heat related illnesses and herbicide volatility that can occur above 85 degrees Fahrenheit (°F). Per USFWS (2007), herbicides will not be applied when weather forecasts indicate rainfall is likely to occur within 48 hours after treatment, and spray applications will not occur when wind speeds exceed 10 miles per hour.

Over the five-year project term, work may occur within the established nest/territory buffer areas under the following conditions:

- During year 1 and year 2 of the vegetation management project, tamarisk removal will not occur within the buffers around occupied SWFL nests/territories, as determined by the SWFL survey results from the previous breeding season. For example, if a SWFL nest within a vegetation management site was occupied or potentially occupied during 2016 surveys, no work would occur within the buffer area in 2017. If that nest is again occupied in 2017, no work would occur in the buffer area in 2018. If the nest/territory is not occupied in 2017, then work could occur in and around the buffer area in 2018.
- In years 3 through 5 of the vegetation management project, when native plantings will have had time to establish and potentially result in a mosaic of different aged successional stands, tamarisk removal may occur in and around previously occupied or unoccupied nests where the qualified biologist has determined that surrounding native vegetation is sufficient to support SFWL nests. Where surveys determine that surrounding native vegetation is not yet sufficient to support SFWL nests, tamarisk removal will not occur within the nest/territory buffer occupied by SWFL, as determined by the SWFL survey results from the previous breeding season.
- The re-treatment of removed tamarisk re-sprouts with herbicide would occur regardless of proximity to nest sites. In other words, where tamarisk is removed, it would be subject to herbicide treatment as needed.

Work crews will likely be composed of: a GWP staff lead to oversee implementation and report on tamarisk removal progress; a local excavator operator to run the excavator and mulching head for safe and efficient heavy equipment operation; and several Arizona Conservation Corps crew staff to operate chainsaws, apply herbicides, and manually haul removed biomass, as needed. All herbicide applicators will complete Environmental Protection Agency's (EPA's) Worker Standard Protection Training.

Native Plant Revegetation

Native plant revegetation methods to be used by the project are summarized in Table 2 and are described in greater detail below.

Table 2. Summary of native plant revegetation methods.

Vegetation management site location/ Condition	Native plant revegetation methods
Current conditions	The vegetation management sites are located almost entirely within occupied or highly suitable SWFL and WYBC habitat. These areas are predicted to be the impacted following beetle colonization. Hand or mechanically-assisted planting of pole cuttings and container stock would be conducted to re-establish SWFL nesting habitat conditions. Native species to be planted may include cottonwood (*Populus deltoides*), narrowleaf (coyote) willow (*Salix exigua*), Goodding's willow (*S. gooddingii*), mulefat (*Baccharis salicifolia*), alkali sacaton (*Sporobolus airoides*), and big sacaton (*S. wrightii*).
Post-wildfire	At burn sites on floodplains with low relative elevations, hand or mechanically-assisted planting of pole cuttings and container stock would be conducted that may include *Populus fremontii, Salix exigua, S. gooddingii, Baccharis salicifolia,* Emory's baccharis (*B. emoryi*), *Sporobolus airoides, S. wrightii, Chilopsis linearis, Hilaria mutica,* and *Hymenoclea monogyra*. At burn sites on terraces (i.e., at elevations not likely to support cottonwood/willow riparian vegetation), hand or mechanically-assisted planting of pole cuttings and container stock would be conducted that may include catclaw acacia (*Acacia greggii*), velvet mesquite (*Prosopis velutina*), Mexican blue elderberry (*Sambucus mexicana*), canyon grape (*Vitis arizonica*), saltbrush (*Atriplex canescens*), and cane bluestem (*Borthriochloa barbinodis*).

Following tamarisk removal activities hand planting, pole cuttings and container stock will be planted. Pole cuttings and container stock will be placed in appropriately deep and sized holes dug with a hand-held auger, or a small excavator with an auger attachment. All container stock will originate from the GWP's native plant nursery. Planting holes will be backfilled with native soil, which may be augmented with a mycorrhizal inoculant to increase the efficiency of nutrient uptake. Plantings are not anticipated to require irrigation, apart from initial watering during planting, as they will be located in close proximity to the mainstem Gila River channel or other typically persistently wet areas. Plantings will not occur unless distance to groundwater is suitable and can be accessed by the plantings using the equipment and methods described above. No supplemental water is anticipated to be used except where agricultural return flows can be rerouted to provide surface moisture over the revegetated areas, such as at the river-right (north) portion of vegetation management site R18.

Planting will occur in coordination with tamarisk removal between October 1 and April 14 outside of the breeding season for WYBC and SWFL, although planting in post-wildfire areas where SWFL breeding habitat does not exist, could occur outside of this period. Pole planting of riparian obligate tree species will occur during their dormancy (generally December–January). Out-planting of container stock grown at the GWP native plant nursery will occur strategically during periods of increased soil moisture. It is expected that optimal planting times will coincide with bi-modal rains, thus reducing the need for supplemental water. Planting efforts that occur

during the SWFL and/or WYBC breeding season will be limited to small crews (3–5 people) using a gas-powered hand auger and hand tools.

Work crews will likely be composed of a GWP staff lead to oversee implementation and report on planting progress, and several Arizona Conservation Corps crew staff.

Earthwork

At the vegetation management sites, minor floodplain excavation or grading may be conducted to create planting surfaces that would allow the roots of planted trees and shrubs to reach groundwater more quickly, and increase their survival and long-term establishment. Identification of these areas at the sites will be confirmed by local groundwater and soil monitoring. In these areas, a small to mid-sized excavator will be used to dig trench- or swale-like features prior to revegetation. Such features would typically be less than 3 ft deep (as measured below the streambank/floodplain surface), 100 ft long (as measured parallel to the river), and 25 ft wide (as measured perpendicular to the river), but large enough to support a planting zone suitable for supporting SWFL habitat. All excavated material will remain on-site and be spread out around the grading area to create natural-looking topography.

Earthwork would occur concurrently with tamarisk removal (i.e., early in the October 1–April 14 work period), in order to allow time for post-earthwork revegetation before the breeding season begins.

Work crews will likely be composed of a GWP staff lead to oversee implementation and report on excavation progress, and a local excavator operator for safe and efficient heavy equipment operation.

Access Routes and Staging Areas

Staging areas for equipment and materials will be located in developed and/or unvegetated areas adjacent to or within vegetation management sites. Staging areas will be located where little to no vegetation clearing or earthwork would be necessary for preparing staging areas, or where such vegetation clearing or earthwork is within a treatment patch.

Existing paved and unpaved roads will be used to the extent practical. However, some routes to treatment patches will require crossing of the low-flow Gila River channel and/or vegetation clearance to provide vehicle access for transporting crews, equipment, and materials. Proposed preliminary access routes are depicted in Figures A2-A8 in Appendix A and tabulated in Table 2 of the BA Addendum; final access routes will be determined after ground-truthing of vegetation management site and surrounding conditions, and will be located using best efforts to avoid occupied or highly suitable SWFL habitat. Proposed preliminary access routes were chosen to avoid areas where SWFL detections and nests were located during the 2014 surveys. No more than 6,240 ft (1.2 mile, or 1.7 acres assuming a 12-ft-wide road) of existing access routes (i.e., existing undeveloped roads and trails) will be cleared using hand tools and/or an excavator equipped with a mulching head (e.g., Torrent EX30 Brush Cutter); although an excavator will be used to clear tamarisk along new access routes, little to no surface grading of new access routes would occur. Vegetation trimming and clearing of native vegetation will be avoided to the extent practical. It is anticipated that nearly all vegetation trimming and clearing for new and existing

access routes will be limited to tamarisk. After it is determined that an access route or staging area will no longer be needed (given monitoring and maintenance activities), the route and staging area will be appropriately reclaimed. Reclamation actions may include removing debris, restoring pre-project topography, scarification of compacted soil, mulch application for erosion control, and/or revegetation with native plants appropriate to the site conditions.

Clearing access routes will occur during the same time periods as tamarisk treatment (October 1 –April 14), although access route clearing in post-wildfire areas where SWFL breeding habitat does not exist, could occur outside of this period.

Work crews will likely be composed of: a GWP staff lead to oversee implementation and report on work progress, a local operator to run grading equipment for safe and efficient heavy equipment operation, and several Arizona Conservation Corps crew members, as needed.

Propagule Collection and Propagation

Cuttings of *S. gooddingii*, *S. exigua*, *P. deltoides* will be collected for project revegetation efforts. Cuttings will be collected from stands of these species within the action area and, if needed, from along irrigation and similar features that are well outside of potentially suitable SWFL habitat. Willow and cottonwood trees naturally established along irrigation canals in the vicinity of Pima and Safford, Arizona will be used to collect native cuttings. The potential cutting sites along irrigation canals are all outside of the river floodway and designated critical habitat boundaries. The exact locations of cutting collections are not known, as they are dependent on the canal companies identifying areas that will be sprayed or burned. Small crews (less than 10 people) will use hand saws, loppers, and, if necessary, chainsaws to remove cuttings of sufficient size for revegetation purposes. Dimensions of cuttings will vary depending on availability and need to minimize impacts, but would ideally be 0.5–3 inches in diameter for *S. exigua*, and 2–8 inches in diameter for *S. gooddingii* and P. *deltoides*. The cuttings would either be directly planted at the vegetation management sites or at the GWP's native plant nursery for treatment and later use.

Cuttings from within the vegetation management areas will potentially be taken from designated SWFL critical habitat and proposed WYBC critical habitat. The following conservation measures are being implemented to reduce impacts to the habitat:

- Cuttings collected in occupied or highly suitable SWFL habitat or in WYBC proposed critical habitat would only be collected during the October 1 –April 14 work period.
- No more than 40 percent of any individual tree or shrub would be removed.
- Crews would scan collection trees and shrubs for nests and would not collect cuttings from any tree or shrub containing a nest or those directly adjacent to or providing cover to the nest.
- Crews would space cuttings from both the stand and the tree to maintain vegetation densities needed for high-quality SWFL and WYBC habitat.

At some vegetation management sites, such as R3, R14, and R15, where mature cottonwood tree canopy is so dense that it shades the understory and precludes the establishment of shrub and herbaceous species, limited, strategic cottonwood trees or limbs may be cut to facilitate understory plant establishment, and the removed material be recycled for cutting plantings.

Monitoring and Maintenance

All vegetation management sites will be monitored at least annually for a minimum of five years to: (1) identify the location and extent of treated tamarisk re-sprouting and determine the need for tamarisk re-treatment; (2) assess the survival of planted pole cuttings and container stock, and determine the need for replacement plantings, alternative species, or alternative planting locations; (3) determine the amount of occupied or highly suitable SWFL and WYBC habitat affected by the project, and the extent of habitat recovery that occurs over the five-year monitoring period; and (4) compare the effectiveness of treatment and revegetation methods to inform future vegetation management efforts before *and* after beetle colonization. An annual monitoring report that documents the findings of this monitoring, and any maintenance actions taken as a result, will be submitted to USACE and USFWS by December 31 in each of the five years.

A qualified/permitted biologist will also be conducting annual surveys for SWFL, incidental SWFL nests, and incidental WYBC occurrences at the vegetation management sites.

If funding allows, additional monitoring parameters and/or an extended monitoring period may be undertaken as a part of the project. The additional monitoring parameters would arise from overarching questions posed by the GWP and their science team, which may include:

- What are the existing (pre-beetle) SWFL and WYBC population distributions and abundances, and how will these respond to the proposed vegetation management efforts before and following beetle colonization?
- What patterns of tamarisk defoliation and mortality emerge following beetle colonization?
- How are other environmental factors (e.g., groundwater levels, soil properties, water quality, and natural recruitment of native plants) responding to initial vegetation management efforts and again following beetle colonization?

Monitoring activities will be overseen by GWP staff and undertaken by crews of 2–4 people, and could occur throughout the year. Monitoring of SWFL and WYBC presence will be conducted by an avian ecologist trained in SWFL and WYBC surveys and permitted by the USFWS and Arizona Game and Fish Department to conduct surveys, and will occur during the SWFL and WYCB breeding season. Equipment installation and/or vehicle access that would involve any potential ground or vegetation disturbing activities will only be conducted during the October 1–April 14 work period.

Anticipated maintenance activities over the five-year project period include tamarisk re-treatment, and replacement or alternative plantings. While the mulching practices described above are intended to minimize establishment of other nonnative invasive plants, there is potential for this to occur and for the need for additional herbicide applications. All maintenance activities would be conducted using the methods, equipment, crews, and schedules described in the sections above.

Conservation Measures

The following measures will be implemented as a part of the project action to avoid and minimize impacts to wildlife and other environmental resources:

1. Protocol surveys for SWFL and WYBC will be conducted by qualified and permitted biologists annually in the project area to assess the potential effects prior to tamarisk removal and the response following tamarisk removal.

2. In order to prevent impacts to SWFLs and WYBCs project work within vegetation management sites will only occur between October 1 and April 14, with the following exceptions that may be conducted at any time of the year: monitoring activities; monitoring equipment installation using hand tools; pre-vegetation management surveys; tamarisk re-sprout treatment and revegetation in areas burned by wildfire; vegetation management site visits and access on foot; and planting of container stock and cuttings to coincide with bi-modal rains.

3. In order to minimize impacts to known SWFL or WYBC nest sites, before any work is initiated within 200 ft of a known SWFL or WYBC nest, a qualified biologist will evaluate the site and identify areas to be avoided, if any, during project activities. A qualified biologist will also be conducting annual protocol surveys for SWFL and nest occupation at the vegetation management sites as a part of the project. This qualified biologist will, when identifying areas to be avoided during project activities, consider the locations of occupied SWFL nests (as determined by the SWFL survey results from the previous breeding season), potential SWFL territories (as determined by repeat bird detections and/or bird behavior), patch size, and the vegetation composition, density, distribution, canopy closure, structure, and soil moisture around the nest/territory, along with the amount of surrounding tamarisk that is removed, to identify buffer areas and shapes. The goal of nest/territory buffers will be to maintain the vegetation density, moisture levels, protection from predators, and other qualities preferred by SWFL for nest sites, such that previously occupied nests /territories could be re-occupied and support successful breeding by SWFL in the following year.

4. In order to minimize impacts to known SWFL nest sites, tamarisk removal will not occur within a minimum of 90 ft of known or potential SWFL nests or territories within or adjacent to vegetation management site boundaries. While nest/territory buffers would be a minimum of 90 ft, as described and depicted in the project description, the use of site conditions to identify buffer areas will likely result in SWFL nest/territory buffers that are greater than 90 ft in some areas and irregularly shaped, rather than circular. Because of irregularly configured habitat, biologists will try to best represent essential flycatcher nesting habitat within the buffer areas. This approach provides a balance between minimizing short-term construction-related impacts to SWFL and carrying out the project's long-term beneficial vegetation management activities as cost efficiently and successfully as possible.

5. A qualified biologist and/or GWP staff person will develop an environmental awareness training program that is specific for the project. All on-site implementation personnel will attend the training before they begin work on the project. Training will include a discussion of the avoidance and minimization measures that are being implemented to protect biological resources as well as the terms and conditions of project permits. Training will include information about the ESA and the consequences of noncompliance. Under this program, workers will be informed about the presence, life history, and habitat requirements of all special-status species that may be affected in the action area. Training also will include information on state and federal laws

protecting nesting birds, wetlands, and other water resources. Safety training will also be included for all field personnel to cover equipment usage, protective clothing, first aid, and emergency plans. Training will also include identification of vegetation types, tamarisk, cottonwood, willow species, and other herbaceous vegetation. A pocket guide that has photographs of these different vegetation types will be developed and provided to all on-site personnel.

6. No in-water or streambank work will occur during rain events or high streamflow events, to minimize erosion.

7. Native vegetation will be avoided to the extent practical.

8. During cutting collection, no more than 40 percent of any individual tree or shrub will be removed; cuttings will not be collected from any tree or shrub containing a nest or those directly adjacent to or providing cover to the nest; cuttings will be limited to maintain vegetation densities needed for high quality SWFL habitat.

9. Mulched tamarisk material (i.e., wood chips) will be left on-site to help retain soil moisture and to further hinder recruitment of nonnative weeds.

10. All litter, debris, unused materials, equipment, and supplies will be removed daily from work areas and deposited at an appropriate disposal or storage site.

11. Stockpiling of construction materials such as portable equipment, vehicles, and supplies, including chemicals, will be restricted to designated staging areas.

12. Any spills of hazardous materials will be cleaned up immediately and reported to the resource agencies within 24 hours. Any such spills, and the success of the efforts to clean them up, will also be reported in post-construction compliance reports.

13. Vehicles will be confined to established and pre-approved access routes, staging areas, and work areas. Access routes and staging areas will be limited to the minimum necessary to achieve the project goals. Routes and boundaries of work areas, including access roads, will be mapped prior to initiating project construction. Vehicular speeds will be kept to 15 miles per hour on unpaved roads with no posted speed limit.

14. All equipment will be properly maintained for the duration of construction. All refueling and maintenance of vehicles and other construction equipment will be restricted to designated work areas and will be at least 100 ft from any down-gradient aquatic habitat unless otherwise isolated from habitat. Proper spill prevention and cleanup equipment will be maintained in all refueling areas.

15. Application of herbicide will be closely supervised and the project will obtain and comply with the conditions of a Pesticide General Permit from ADEQ.

16. When working within 20 feet of the Gila River and other aquatic habitats, triclopyr herbicide will only be applied to cut tamarisk stumps, tamarisk re-sprouts by hand "painting" (backpack sprayers will not be used).

17. Per the USFWS (2007) Recommended Protection Measures for Pesticide Applications in Region 2 of the U.S. Fish and Wildlife Service, pesticides will not be mixed, stored, or handled near sensitive areas. Excess pesticide and empty pesticide containers will not be allowed to remain near species habitat or waterbodies and will be discarded at authorized landfills or other appropriate sites. Application equipment will be well-maintained and checked periodically for leaks, worn parts, and calibration.

18. Per the USFWS (2007) Recommended Protection Measures for Pesticide Applications in Region 2 of the U.S. Fish and Wildlife Service, herbicides will not be applied when weather forecasts indicate rainfall is likely to occur within 48 hours after treatment, and spray applications will not occur when wind speeds exceed 10 miles per hour.

19. Within two months after submitting the annual monitoring report for calendar year 2017, GWP will convene a mid-project evaluation meeting with USACE, USFWS, and BLM to discuss a synthesis of monitoring results provided by GWP, and progress made toward the project's long-term ecological goals, based upon available data. The meeting may be in-person or via conference call, with the intention of establishing consensus with mentioned stakeholders on the best path forward for the project and whether adaptive management may be necessary. Items such as project success, necessary improvements, timing/progress, flycatcher and cuckoo status in the project areas, adaptive management, leaf beetle presence and/or impacts are viable discussion topics.

STATUS OF THE SPECIES AND CRITICAL HABITAT

Southwestern willow flycatcher

Description

The SWFL is a small grayish-green passerine bird (Family Tyrannidae) measuring approximately 5.75 inches. The song is a sneezy "fitz-bew" or a "fit-a-bew", the call is a repeated "whit." It is one of four currently recognized willow flycatcher subspecies (Phillips 1948, Unitt 1987, Browning 1993). It is a neotropical migrant that breeds in the southwestern U.S. and migrates to Mexico, Central America, and possibly northern South America during the non-breeding season (Phillips 1948, Stiles and Skutch 1989, Peterson 1990, Ridgely and Tudor 1994, Howell and Webb 1995). The historical breeding range of the SWFL included southern California, Arizona, New Mexico, western Texas, southwestern Colorado, southern Utah, extreme southern Nevada, and extreme northwestern Mexico (Sonora and Baja) (Unitt 1987).

Listing and critical habitat
The SWFL was listed as endangered, without critical habitat on February 27, 1995 (USFWS 1995). Critical habitat was later designated on July 22, 1997 (USFWS 1997a). A correction notice was published in the Federal Register on August 20, 1997 to clarify the lateral extent of the designation (USFWS 1997b).

On May 11, 2001, the 10th circuit court of appeals set aside designated critical habitat in those states under the 10th circuit's jurisdiction (New Mexico). The FWS decided to set aside critical habitat designated for the SWFL in all other states (California and Arizona) until it could re-assess the economic analysis.

On October 19, 2005, the FWS re-designated critical habitat for the SWFL (USFWS 2005). A total of 737 river miles across southern California, Arizona, New Mexico, southern Nevada, and southern Utah were included in the final designation. The lateral extent of critical habitat includes areas within the 100-year floodplain.

On August 15, 2011, the FWS proposed a revision to the critical habitat designation, identifying stream segments in each of the 29 Management Units where there are recovery goals (USFWS 2011). These segments totaled 2,090 stream miles. Similar to the 2005 rule, the lateral extent of critical habitat includes only the riparian areas within the 100-year floodplain. About 790 stream miles were identified as areas we will consider for exclusion from the final designation under section 4(b)(2) of the Act.

On January 3, 2013, the FWS completed its SWFL critical habitat revision by designating approximately 1,227 stream miles as critical habitat. These areas are designated as stream segments, with the lateral extent including the riparian areas and streams that occur within the 100-year floodplain or flood-prone areas encompassing a total area of approximately 208,973 acres. About 948 stream miles of proposed critical habitat were excluded from the final revised designation.

A final recovery plan for the SWFL was signed by the FWS Region 2 Director and released to the public in March, 2003 (USFWS 2002). The Plan describes the reasons for endangerment, current status of the SWFL, addresses important recovery actions, includes detailed issue papers on management issues, and provides recovery goals. Recovery is based on reaching numerical and habitat related goals for each specific Management Unit established throughout the subspecies range and establishing long-term conservation plans (USFWS 2002).

The five-year review for the SWFL was completed in August 2014 by the Arizona Ecological Services Field Office and is posted on the Field Office's web site (http://www.fws.gov/southwest/es/arizona/Southwes.htm).

Reasons for endangerment
Reasons for decline have been attributed to primarily loss, modification, and fragmentation of riparian breeding habitat, along with a host of other factors including loss of wintering habitat and brood parasitism by the brown-headed cowbird (Sogge *et al.* 1997, McCarthey *et al.* 1998). Habitat loss and degradation are caused by a variety of factors, including urban, recreational, and

agricultural development, water diversion and groundwater pumping, channelization, dams, and excessive livestock grazing. Fire is an increasing threat to SWFL habitat (Paxton *et al.* 1996), especially in monotypic saltcedar vegetation (DeLoach 1991) and where water diversions and/or groundwater pumping desiccates riparian vegetation (Sogge *et al.* 1997). SWFL nests can be parasitized by brown-headed cowbirds (*Molothrus ater*), which lay their eggs in the host's nest. Feeding sites for cowbirds are enhanced by the presence of livestock and range improvements such as waters and corrals; agriculture; urban areas; golf courses; bird feeders; and trash areas. When these feeding areas are in close proximity to SWFL breeding habitat, especially coupled with habitat fragmentation, cowbird parasitism of SWFL nests may increase (Hanna 1928, Mayfield 1977a,b, Tibbitts *et al.* 1994).

Habitat

The SWFL breeds in dense riparian habitats from sea level in California to approximately 8,500 feet in Arizona and southwestern Colorado. Historical egg/nest collections and species' descriptions throughout its range describe the SWFL's widespread use of willow (*Salix* spp.) for nesting (Phillips 1948, Phillips *et al.* 1964, Hubbard 1987, Unitt 1987, San Diego Natural History Museum 1995). Currently, SWFLs primarily use Geyer willow (*Salix geyeriana*), coyote willow (*Salix exigua*), Goodding's willow (*Salix gooddingii*), boxelder (*Acer negundo*), saltcedar (*Tamarix* sp.), Russian olive (*Elaeagnus angustifolio*), and live oak (*Quercus agrifolia*) for nesting. Other plant species less commonly used for nesting include: buttonbush (*Cephalanthus* sp.), black twinberry (*Lonicera involucrata*), cottonwood (*Populus* spp.), white alder (*Alnus rhombifolia*), blackberry (*Rubus ursinus*), and stinging nettle (*Urtica* spp.). Based on the diversity of plant species composition and complexity of habitat structure, four basic habitat types can be described for the SWFL: monotypic willow, monotypic exotic, native broadleaf dominated, and mixed native/exotic (Sogge *et al.* 1997).

The SWFL's habitat is dynamic and can change rapidly: nesting habitat can grow out of suitability; saltcedar habitat can develop from seeds to suitability in about four to five years; heavy runoff can remove/reduce habitat suitability in a day; or river channels, floodplain width, location, and vegetation density may change over time. The SWFL's use of habitat in different successional stages may also be dynamic. For example, over-mature or young habitat not suitable for nest placement can be occupied and used for foraging and shelter by migrating, breeding, dispersing, or non-territorial SWFLs (McLeod *et al.* 2005, Cardinal and Paxton 2005). SWFL habitat can quickly change and vary in suitability, location, use, and occupancy over time (Finch and Stoleson 2000).

Tamarisk is an important component of the SWFL's nesting and foraging habitat in the central part of the SWFL's breeding range in Arizona, southern Nevada and Utah, and western New Mexico. In 2001 in Arizona, 323 of the 404 (80 percent) known SWFL nests (in 346 territories) were built in tamarisk trees (Smith *et al.* 2002). Tamarisk had been believed by some to be a habitat type of lesser quality for the SWFL, however comparisons of reproductive performance (USFWS 2002), prey populations (Durst 2004) and physiological conditions (Owen and Sogge 2002) of SWFLs breeding in native and exotic vegetation has revealed no difference (Sogge *et al.* 2005).

The introduced tamarisk leaf beetle was first detected affecting tamarisk within the range of the SWFL in 2008 along the Virgin River in St. George, Utah. Initially, this insect was not believed to be able to move into or survive within the southwestern United States in the breeding range of the SWFL. Along this Virgin River site in 2009, 13 of 15 SWFL nests failed following vegetation defoliation (Paxton *et al.* 2010). As of 2012, the beetle has been found in southern Nevada/Utah and northern Arizona/New Mexico within the SWFL's breeding range. It was detected along the Colorado River below Hoover Dam in 2012. Because tamarisk is a component of about 50 percent of all known SWFL territories (Durst *et al.* 2008), continued spread of the beetle has the potential to significantly alter the distribution, abundance, and quality of SWFL nesting habitat and impact breeding attempts.

Breeding biology

Throughout its range the SWFL arrives on breeding grounds in late April and May (Sogge and Tibbitts 1992, Sogge *et al.* 1993, Sogge and Tibbitts 1994, Muiznieks *et al.* 1994, Maynard 1995, Sferra *et al.* 1995, 1997). Nesting begins in late May and early June and young fledge from late June through mid-August (Willard 1912, Ligon 1961, Brown 1988a,b, Whitfield 1990, Sogge and Tibbitts 1992, Sogge *et al.* 1993, Muiznieks *et al.* 1994, Whitfield 1994, Maynard 1995). SWFLs typically lay three to four eggs per clutch (range = 1 to 5). Eggs are laid at one-day intervals and are incubated by the female for approximately 12 days (Bent 1960, Walkinshaw 1966, McCabe 1991). Young fledge approximately 12 to 13 days after hatching (King 1955, Harrison 1979). Typically one brood is raised per year, but birds have been documented raising two broods during one season and renesting after a failure (Whitfield 1990, Sogge and Tibbitts 1992, Sogge *et al.* 1993, Sogge and Tibbitts 1994, Muiznieks *et al.* 1994, Whitfield 1994, Whitfield and Strong 1995). The entire breeding cycle, from egg laying to fledging, is approximately 28 days.

SWFL nests are fairly small (3.2 inches tall and 3.2 inches wide) and its placement in a shrub or tree is highly variable (1.6 to 60 feet off the ground). Nests are open cup structures, and are typically placed in the fork of a branch. Nests have been found against the trunk of a shrub or tree (in monotypic saltcedar and mixed native broadleaf/saltcedar habitats) and on limbs as far away from the trunk as 10.8 feet (Spencer *et al.* 1996). Typical nest placement is in the fork of small-diameter (e.g., 0.4 in), vertical or nearly vertical branches (USFWS 2002). Occasionally, nests are placed in down-curving branches. Nest height varies considerably, from 1.6 to 60 feet, and may be related to height of nest plant, overall canopy height, and/or the height of the vegetation strata that contain small twigs and live growth (USFWS 2002). Typically, nests are relatively low, 6.5 to 23 feet above ground (USFWS 2002). Nests built in habitat dominated by box elders are placed highest in the tree (upwards of 60 feet) (USFWS 2002).

The SWFL is an insectivore, foraging in dense shrub and tree vegetation along rivers, streams, and other wetlands. The bird typically perches on a branch and makes short direct flights, or sallies to capture flying insects. Drost *et al.* (1998) found that the major prey items of the SWFL (in Arizona and Colorado), consisted of true flies (Diptera); ants, bees, and wasps (Hymenoptera); and true bugs (Hemiptera). Other insect prey taxa included leafhoppers (Homoptera: Cicadellidae); dragonflies and damselflies (Odonata); and caterpillars (Lepidoptera larvae). Non-insect prey included spiders (Araneae), sowbugs (Isopoda), and fragments of plant material.

Brown-headed cowbird parasitism of SWFL broods has been documented throughout its range (Brown 1988a,b, Whitfield 1990, Muiznieks *et al.* 1994, Whitfield 1994, Hull and Parker 1995, Maynard 1995, Sferra *et al.* 1995, Sogge 1995b). Where studied, high rates of cowbird parasitism have coincided with SWFL population declines (Whitfield 1994, Sogge 1995a,c, Whitfield and Strong 1995) or, at a minimum, resulted in reduced or complete nesting failure at a site for a particular year (Muiznieks *et al.* 1994, Whitfield 1994, Maynard 1995, Sferra *et al.* 1995, Sogge 1995a,c, Whitfield and Strong 1995). Cowbird eggs hatch earlier than those of many passerine hosts, thus giving cowbird nestlings a competitive advantage (Bent 1960, McGeen 1972, Mayfield 1977a,b, Brittingham and Temple 1983). SWFLs can attempt to renest, but it often results in reduced clutch sizes, delayed fledging, and reduced nest success (Whitfield 1994). Whitfield and Strong (1995) found that SWFL nestlings fledged after July 20th had a significantly lower return rate and cowbird parasitism was often the cause of delayed fledging.

Territory and home range size

SWFL territory size likely fluctuates with population density, habitat quality, and nesting stage. Estimated territory sizes recorded at the Kern River were 0.59 to 3.21 acres for monogamous males and 2.72 to 5.68 acres for polygynous males (Whitfield and Enos 1996). Within a 2.22 acre patch on Colorado River, estimated territory sizes were 0.15 to 0.49 acres (Sogge 1995c), and in a 3.71 acre patch on the Verde River, 0.49 to 1.24 acres (Sogge 1995a). Territories are established within a larger patch of appropriate habitat sufficient to contain several nesting pairs of SWFLs.

Cardinal and Paxton (2005) found that the home ranges of telemetered SWFLs at Roosevelt Lake, Arizona, varied from 0.37 to 890 acres. Bird movements just prior to and following nesting were the greatest, while movements while incubating and with nestlings were the most limited. Movements following fledging of young indicated possible pre-migration staging and the targeting of local increases in insect prey populations. Birds were found using a variety of riparian habitat in a variety of conditions (open, young mature, exotic, mixed, etc.) and the distances moved indicate that birds can occupy a larger area and used more different types of habitat than previously believed (Cardinal and Paxton 2005).

Movements

The site and patch fidelity, dispersal, and movement behavior of adult, nestling, breeding, non-breeding, and migratory SWFLs are just beginning to be understood (Kenwood and Paxton 2001, Koronkiewicz and Sogge 2001). From 1997 through 2000, 66 to 78 percent of SWFLs known to have survived from one breeding season to the next returned to the same breeding site; conversely, 22 to 34 percent of returning birds moved to different sites (Luff *et al*. 2000). A large percentage (75%) of known surviving 2000 adults returned in 2001 to their same breeding site (Kenwood and Paxton 2001). Just considering Roosevelt Lake in its entirety, all but three surviving birds (n=28) banded at Roosevelt Lake returned to Roosevelt Lake (Kenwood and Paxton 2001). Although most SWFLs return to former breeding sites, SWFLs can regularly move among sites within and between years (Kenwood and Paxton 2001). Within-drainage movements are more common than between-drainage movements (Kenwood and Paxton 2001). Year-to-year movements of birds have been detected between the San Pedro/Gila river confluence and Roosevelt Lake, the Verde River near Camp Verde and Roosevelt Lake, and the

Little Colorado River near Greer and Roosevelt Lake (Kenwood and Paxton 2001). Typical distances moved range from 1.2 to 18 miles. However, long-distance movements of up to 137 miles have been observed on the lower Colorado River and Virgin River (McKernan and Braden 2001). Breeding groups of SWFLs act as a meta-population (Busch *et al.* 2000).

Table 3. Estimated rangewide population for the SWFL based on 1993 to 2007 survey data for Arizona, California, Colorado, New Mexico, Nevada, Utah, and Texas[1].

State	Number of sites with WIFL territories 1993-07[2]	Percentage of sites with WIFL territories 1993-07	Number of territories[3]	Percentage of total territories
Arizona	124	43.1 %	459	35.3 %
California	96	33.3 %	172	13.2 %
Colorado	11	3.8 %	66	5.1 %
Nevada	13	4.5 %	76	5.9 %
New Mexico	41	14.2 %	519	40.0 %
Utah	3	1.0 %	7	0.5%
Texas	?	?	?	?
Total	288	100 %	1,299	100 %

[1]Durst *et al.* 2008.
[2]Site boundaries are not defined uniformly throughout the bird's range.
[3] Total territory numbers recorded are based upon the most recent years survey information from that site between 1993 and 2007.

Rangewide distribution and abundance

There are currently 288 known SWFL breeding sites in California, Nevada, Arizona, Utah, New Mexico, and Colorado (all sites from 1993 to 2007 where a territorial SWFL has been detected) holding an estimated 1,299 territories (Durst *et al.* 2008). It is difficult to arrive at a grand total of SWFL territories since not all sites are surveyed annually. Numbers have increased since the bird was listed and some habitat remains unsurveyed; however, after nearly a decade of intense surveys, the existing numbers are just past the upper end of Unitt's (1987) estimate of 20 years ago (500-1000 pairs). About 50 percent of the 1,299 estimated territories (Table 5) throughout the subspecies range are located at four general locations (Cliff/Gila Valley – New Mexico,

Roosevelt Lake - Arizona, San Pedro River/Gila River confluence – Arizona, Middle Rio Grande, New Mexico).

Arizona distribution and abundance
While numbers have significantly increased in Arizona (145 to 459 territories from 1996 to 2007) (English *et al.* 2006, Durst *et al.* 2008), overall distribution of SWFLs throughout the state has not changed much. Currently, population stability in Arizona is believed to be largely dependent on the presence of three population centers (Roosevelt Lake, San Pedro/Gila River confluence, upper Gila River). Therefore, the result of catastrophic events or losses of significant populations either in size or location could greatly change the status and survival of the bird. Conversely, expansion into new habitats or discovery of other populations would improve the known stability and status of the SWFL.

Fire
The evidence suggests that fire was not a primary disturbance factor in southwestern riparian areas near larger streams (USFWS 2002). Yet, in recent time, fire size and frequency has increased on the lower Colorado, Gila, Bill Williams, and Rio Grande rivers. The increase has been attributed to increasing dry, fine fuels as a result of the cessation of flood flows and human caused ignition sources. The spread of the highly flammable plant, tamarisk, and drying of river areas due to river flow regulation, water diversion, lowering of groundwater tables, and other land practices is largely responsible for these fuels. A catastrophic fire in June of 1996, destroyed approximately a half mile of occupied tamarisk SWFL nesting habitat on the San Pedro River in Pinal County. That fire resulted in the forced dispersal or loss of up to eight pairs of SWFLs (Paxton *et al.* 1996). Smaller fires have occurred along the upper most portion of the San Pedro River closer to the Mexico Border and another large fire occurred on the lower San Pedro River at the Nature Conservancy's San Pedro Preserve between Winkelman and Dudleyville in 2004. Recreationists cause over 95 percent of the fires on the lower Colorado River (USFWS 2002). In California, Brothers (1984) attributed increased fire along the Owens River to more use of the riparian zones by campers and fishermen in the past 30 years.

Critical habitat
The primary constituent elements of designated critical habitat are based on riparian plant species, structure and quality of habitat and insects for prey.

1. Primary Constituent Element 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, coyote willow, Geyer's willow, arroyo willow, red willow, yewleaf willow, pacific willow, boxelder, tamarisk, Russian olive, buttonbush, cottonwood, stinging nettle, alder, velvet ash, poison hemlock, blackberry, seep willow, oak, rose, sycamore, false indigo, Pacific poison ivy, grape, Virginia creeper, Siberian elm, and walnut) and some combination of:
    (a) Dense riparian vegetation with thickets of trees and shrubs that can range in height from about about 6 to 98 ft. Lower-stature thickets (6 to 13 ft 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 above ground or dense foliage only at the shrub or tree level as a low, dense canopy;
(c) Sites for nesting that contain a dense (about 50 percent to 100 percent) tree or shrub (or both) canopy (the amount of cover provided by tree and shrub branches measured from the ground);
(d) Dense patches of riparian forests that are interspersed with small openings of open water or marsh or areas with shorter and sparser vegetation that creates a variety of habitat that is not uniformly dense. Patch size may be as small as 0.25 ac or as large as 7,175 ac.

2. Primary Constituent Element 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*).

The physical and biological features of SWFL critical habitat are the principal biological or physical elements essential to SWFL conservation which may require special management considerations or protection (USFWS 2013a). We primarily identified the features and functions of rivers that generate SWFL habitat and its food such as low gradient/broad floodplains, water, saturated soil, hydrologic regimes, elevated groundwater, and fine sediments, etc. (USFWS 2013a).

Past Consultations
Since listing in 1995, at least 228 Federal agency actions have undergone (or are currently under) formal section 7 consultation throughout the SWFL's range. This list of consultations is maintained in our office. We concluded in our biological opinion for the Southwestern Regional Land Resource Management Plan (LRMP) (USFWS 2005a, #2-22-03-F-366) that ongoing upland grazing associated with Management Area 6J (Code 1423) of Tonto Creek on the Tonto National Forest would cause a sub-lethal response (-2) to the SWFL. The conclusion in the LRMP that continued grazing can facilitate decreased bank stabilization, increased run-off, increased sedimentation, increased erosion, and reduced capacity of soils to hold water. These factors would reduce the occurrence, longevity, and quality of the habitat-based Primary Constituent Elements of SWFL critical habitat. The LRMP was completed prior to the USFS adopting a policy of rangeland adaptive management in Chapter 90 of FSH 2209.13. Since SWFL critical habitat was finalized in 2005, at least 33 formal opinions have been completed in Arizona (within and outside designated critical habitat). While many opinions were issued for the previous critical habitat designation, the stream reaches and constituent elements have changed.

Activities continue to adversely affect the distribution and extent of all stages of SWFL habitat throughout its range (development, urbanization, grazing, recreation, native and non-native habitat removal, dam operations, river crossings, ground and surface water extraction, etc.). Introduced tamarisk eating leaf beetles were not anticipated to persist within the range of the southwestern willow SWFL. However, they were detected within the breeding habitat (and designated critical habitat) of the SWFL in 2008 along the Virgin River near the Town of St.

George, Utah. In 2009, beetles were also known to have been detected defoliating habitat within the range of SWFL habitat in southern Nevada, and along the Colorado River in the Grand Canyon and near Shiprock in Arizona. Stochastic events also continue to change the distribution, quality, and extent of SWFL habitat.

Conservation measures associated with some consultations and Habitat Conservation Plans have helped to acquire lands specifically for SWFLs on the San Pedro, Verde, and Gila rivers in AZ and the Kern River in CA. Additionally, along the lower Colorado River, the U.S. Bureau of Reclamation is currently attempting to establish riparian vegetation to expand and improve the distribution and abundance of nesting SWFLs. A variety of Tribal Management Plans in CA, AZ, and NM have been established to guide conservation of the SWFLs. Additionally, during the development of the critical habitat rule, management plans were developed for some private lands along the Owens River in CA and Gila River in NM. These are a portion of the conservation actions that have been established across the subspecies' range.

YELLOW-BILLED CUCKOO

The Western Distinct Population Segment (DPS) of the yellow-billed cuckoo was listed as a threatened species on October 3, 2014 (USFWS 2014a). Critical habitat was proposed on August 15, 2014 (USFWS 2014b).

Physical Characteristics
Adult yellow-billed WYBCs have moderate to heavy bills, somewhat elongated bodies and a narrow yellow ring of colored bare skin around the eye. The plumage is grayish-brown above and white below, with reddish primary flight feathers. The tail feathers are boldly patterned with black and white below. They are a medium-sized bird about 12 inches in length, and about 2 ounces in weight. Males and females differ slightly; the males have a slightly smaller body size, smaller bill, and the white portions of the tail tend to form distinct oval spots. In females the white spots are less distinct and tend to be connected (Hughes 1999).

Morphologically, the yellow-billed cuckoos throughout the western continental United States and Mexico are generally larger, with significantly longer wings, longer tails, and longer and deeper bills (Franzreb and Laymon 1993). Birds with these characteristics occupy the Western DPS and we refer to them as the "western yellow-billed cuckoo." Only the Western DPS was listed as a threatened species (USFWS 2014a). WYBCs in the west arrive on the breeding grounds 4 to 8 weeks later than eastern yellow-billed cuckoos at similar latitude (Franzreb and Laymon 1993, Hughes 1999).

Distribution
The WYBC is a member of the avian family Cuculidae and is a Neotropical migrant bird that winters in South America and breeds in North America. The breeding range of the entire species formerly included most of North America from southeastern and western Canada (southern Ontario and Quebec and southwestern British Colombia) to the Greater Antilles and northern Mexico (AOU 1957, AOU 1983, AOU 1998).

Based on historical accounts, the WYBC was formerly widespread and locally common in California and Arizona, more narrowly distributed but locally common in New Mexico, Oregon, and Washington and uncommon along the western front of the Rocky Mountains north to British Columbia (AOU 1998, Hughes 1999). The species may be extirpated from British Colombia, Washington, and Oregon (Hughes 1999). The WYBC is now very rare in scattered drainages in western Colorado, Idaho, Nevada, and Utah, with single, nonbreeding birds most likely to occur (USFWS 2001). The largest remaining breeding areas are in southern and central California, Arizona, along the Rio Grande in New Mexico, and in northwestern Mexico (USFWS 2013b).

The current breeding population is low, with estimates of approximately 350 to 495 pairs north of the Mexican border and another 330 to 530 pairs in Mexico for a total of 680 to 1,025 breeding pairs (USFWS 2013b).

WYBCs spend the winter in South America, east of the Andes, primarily south of the Amazon Basin in southern Brazil, Paraguay, Uruguay, eastern Bolivia, and northern Argentina (Ehrlich *et al.* 1992, AOU 1998, Johnson *et al*. 2008b). The species as a whole winters in woody vegetation bordering fresh water in the lowlands to 4,921 ft, including dense scrub, deciduous broadleaf forest, gallery forest, secondary forest, subhumid and scrub forest, and arid and semiarid forest edges (Hughes 1999). Wintering habitat of the WYBC is poorly known.

Migration

Little is known about migratory habitat for the WYBC. WYBCs may be found in a variety of vegetation types during migration, including coastal scrub, secondary growth woodland, hedgerows, humid lowland forests, and forest edges from sea level to 8,125 ft (2,500 m) (Hughes 1999). Additionally, during migration they may be found in smaller riparian patches than those in which they typically nest. This variety of vegetation types suggests that the habitat needs of the WYBC during migration are not as restricted as their habitat needs when nesting and tending young.

Habitat and Life History

Food

WYBCs forage primarily by gleaning insects from vegetation, but they may also capture flying insects or small vertebrates such as frogs and lizards (Hughes 1999). They specialize on relatively large invertebrate prey, including caterpillars (*Lepidoptera* sp.), katydids (*Tettigoniidae* sp.), cicadas (*Cicadidae* sp.), and grasshoppers (*Caelifera* sp.) (Laymon *et al.* 1997). Minor prey includes beetles (*Coleoptera* sp.), dragonflies (*Odonata* sp.), praying mantis (*Mantidae* sp.), flies (*Diptera* sp.), spiders (*Araneae* sp.), butterflies (*Lepidoptera* sp.), caddis flies (*Trichoptera* sp.), crickets (*Gryllidae* sp.), wild berries, and bird eggs and young (Laymon *et al.* 1997, Hughes 1999). Prey species composition varies geographically. Their breeding season may be timed to coincide with outbreaks of insect species, particularly tent caterpillars (Hughes 1999, USFWS 2001a) or cicadas (Johnson *et al.* 2007, Halterman 2009). In Arizona, fledging occurred at the peak emergence of cicadas (Rosenberg *et al.* 1982).

In the arid West, these conditions are usually found in cottonwood-willow and mesquite riparian associations along water courses and in madrean Evergreen woodlands in the foothills and mountains of southeastern Arizona and southwestern New Mexico (Cornell Lab of Ornithology

2012; Westland Resources 2013a, 2013b; American Birding Association 2014). The arrival of birds and the timing of nesting are geared to take advantage of any short-term abundance of prey. In years of high insect abundance, WYBCs lay larger clutches (3-5 eggs rather than two), a larger percentage of eggs produce fledged young, and they breed multiple times (2-3 nesting attempts rather than one)(Laymon *et al.* 1997). WYBC food availability is largely influenced by the health, density, and species of vegetation. Desiccated riparian sites produce fewer suitable insects than healthy moist sites.

Breeding Habitat

WYBCs breed in dense riparian woodlands, primarily of cottonwood (*Populus fremontii*), willow (*Salix* spp.), and mesquite (*Prosopis* spp.), along riparian corridors in otherwise arid areas (Laymon and Halterman 1989, Hughes 1999). Dense undergrowth may be an important factor in selection of nest sites. Occupied habitat in Arizona may also contain box elder (*Acer negundo*), Arizona alder (*Alnus oblongifolia*), Arizona walnut (*Juglans major*), Arizona sycamore (*Platanus wrightii*), oak (*Quercus* spp.), netleaf hackberry (*Celtis reticulata*), velvet ash (*Fraxinus velutina*), Mexican elderberry (*Sambuccus mexicanus*), tamarisk (*Tamarix* spp.; also called salt cedar), and seepwillow (*Baccharis glutinosa*)(Corman and Magill 2000). Surveys conducted by the Arizona Breeding Bird Atlas (Corman and Wise-Gervais 2005) reported 68 percent of the WYBC observations were in lowland riparian woodlands, often containing a variable combination of Fremont cottonwood, willow, velvet ash, Arizona walnut, mesquite, and tamarisk (Corman and Wise-Gervais 2005). Narrow bands of riparian woodland can contribute to the overall extent of suitable habitat. Adjacent habitat on terraces or in the upland (such as mesquite) can enhance the value of these narrow bands of riparian woodland.

Throughout the WYBC range, a large majority of nests are placed in willow trees, but alder (*Alnus* spp.), cottonwood, mesquite, walnut (*Juglans* spp.), box elder, sycamore, netleaf hackberry (*Celtis laevigata* var. *reticulata*), soapberry (*Sapindus saponaria*), and tamarisk are also used (Laymon 1980, Hughes 1999, Corman and Magill 2000 , Corman and Wise-Gervais 2005, Holmes et al. 2008). Tamarisk is also a riparian species that may be associated with breeding under limited conditions; WYBC will sometimes build their nests and forage in tamarisk, but there is usually a native riparian tree component within the occupied habitat (Gaines and Laymon 1984, Johnson et al. 2008a).

WYBCs reach their breeding range later than most other migratory breeders, often in June (Rosenberg et al. 1982). They construct an unkempt stick nest on a horizontal limb in a tree or large shrub. Nest height ranges from 4 ft to (rarely) 100 ft, but most are typically below 30 ft (Hughes 1999). The incubation period for the WYBC is 9 to 11 days, and young leave the nest at 7 to 9 days old. Although other species of cuckoos are often or always brood parasites of other birds, WYBCs do so only infrequently, possibly in response to high food resources that allow rapid egg production (Fleischer et al. 1985). Nesting usually occurs between late June and late July, but can begin as early as late May and continue until late September (Hughes 1999).

The WYBC primarily breeds in riparian habitat along low-gradient (surface slope less than 3%) rivers and streams, and in open riverine valleys that provide wide floodplain conditions (greater than 325 ft). In the southwest, it can also breed in high gradient drainages, and narrower and drier reaches of riparian or Madrean Evergreen woodland habitat. Within the boundaries of the

distinct population segment (DPS)(see Figure 2 at 78 FR 61631,) these riparian areas are located from southern British Columbia, Canada, to southern Sinaloa, Mexico, and may occur from sea level to 7,000 ft (or slightly higher in western Colorado, Utah, and Wyoming) in elevation. The moist conditions that support riparian plant communities that provide WYBC habitat typically exist in lower elevation, broad floodplains, as well as where rivers and streams enter impoundments. In southeastern Arizona, however, WYBCs were often found nesting along intermittent drainages with dense stands of velvet mesquite and netleaf hackberry (Corman and Wise-Gervais 2005, AGFD 2011). WYBCs are also found in higher mountain drainages where Arizona sycamore, Arizona alder, or mixed oak assemblages are the dominant riparian species (Cornell Lab of Ornithology 2012; Westland Resources 2013a, 2013b; American Birding Association 2014). Dense understory foliage appears to be an important factor in nest site selection, while cottonwood trees are an important foraging habitat in areas where the species has been studied in California (USFWS 2001). In the extreme southern portion of their summer range in the States of Sonora (southern quarter) and Sinaloa, Mexico, WYBCs also nest in upland thorn scrub and dry deciduous habitats away from the riparian zone (Russell and Monson 1988), though their densities are lower in these habitats than they are in adjacent riparian areas. At the landscape level, the available information suggests the WYBC requires large tracts of willow-cottonwood or mesquite forest or woodland for their nesting season habitat. Habitat can be relatively dense, contiguous stands, irregularly shaped mosaics of dense vegetation with open areas, or narrow and linear.

Canopy cover directly above the nest is generally dense and averages 89 percent and is denser at the South Fork Kern River (93 percent) and Bill Williams River (94 percent) than at the San Pedro River (82 percent). Canopy closure in a plot around the nest averages 71 percent and was higher at the Bill Williams River (80 percent) than at the South Fork Kern River (74 percent) or San Pedro River (64 percent) (Laymon et al. 1997, Halterman 2003, Halterman 2004, Halterman 2005, Halterman 2006).

The optimal size of habitat patches for the species are generally greater than 200 ac and have dense canopy closure and high foliage volume of willows and cottonwoods (Laymon and Halterman 1989) and thus provide adequate space for foraging and nesting. Tamarisk, a nonnative tree species, may be a component of the habitat, especially in Arizona and New Mexico. Sites with a monoculture of tamarisk are usually unsuitable habitat for the species. The association of breeding with large tracts of suitable riparian habitat is likely related to home range size. Individual home ranges during the breeding season average over 100 ac, and home ranges up to 500 ac have been recorded (Laymon and Halterman 1987, Halterman 2009, Sechrist et al. 2009, McNeil et al. 2011, McNeil et al. 2012).

In addition to the dense nesting grove, WYBCs need adequate foraging areas near the nest. Foraging areas can be less dense or patchy with lower levels of canopy cover and may be a mix of shrubs, ground cover, and scattered trees (USFWS, unpubl. data). Optimal breeding habitat contains groves with dense canopy closure and well-foliaged branches for nest building with nearby foraging areas consisting of a mixture of cottonwoods, willows, or mesquite with a high volume of healthy foliage (USFWS 2013b).

Riparian habitat is dynamic, and species may move from one area to another over time. WYBCs may nest at more than one location in a year. Some individuals also roam widely (several hundred miles), apparently assessing food resources before selecting a nest site (Sechrist et al. 2012).

During movements between nesting attempts WYBCs are found at riparian sites with small groves or strips of trees, sometimes less than 10 ac in extent (Laymon and Halterman 1989). These stopover and foraging sites can be similar to breeding sites, but are smaller, narrower, and lack understory vegetation when compared to nesting sites.

Water and Humidity

Habitat for the WYBC is largely associated with perennial rivers and streams that support the expanse of vegetation characteristics needed by breeding WYBCs. The range and variation of stream flow frequency, magnitude, duration, and timing that will establish and maintain WYBC habitat can occur in different types of regulated and unregulated flows depending on the interaction of the water and the physical characteristics of the landscape (Poff et al. 1997; USFWS 2002, 2013b).

Hydrologic conditions at WYBC breeding sites can vary widely between years. At some locations during low rainfall years, water or saturated soil is not available. At other locations, particularly at reservoir inlets, riparian vegetation can be inundated for extended periods in some years and be totally dry in other years. This is particularly true of reservoirs like Lake Isabella in California, Roosevelt and Horseshoe Reservoirs in Arizona, and Elephant Butte Reservoir in New Mexico, all of which have relatively large WYBC populations. This year-to-year change in hydrology can affect food availability and habitat suitability for WYBCs. In some areas, managed hydrologic cycles above or below dams can create temporary WYBC habitat, but may not be able to support it for an extended time, or may support varying amounts of habitat at different points of the cycle and in different years. Water management operations create varied situations that allow different plant species to thrive when water is released below a dam, held in a reservoir, or removed from a lakebed, and consequently, varying amounts of WYBC habitat are available from month to month and year to year as a result of dam operations. During wet years, habitat within a lake and below a dam can be flooded for extended periods and stressed or killed. During dry years, habitat can be desiccated and stressed or killed because of lack of water (Poff et al. 1997, Greco 1999, National Academy of Sciences 2002; USFWS 2002, 2013b).

Humid conditions created by surface and subsurface moisture appear to be important habitat parameters for WYBC. The species has been observed as being restricted to nesting in moist riparian habitat in the arid West because of humidity requirements for successful hatching and rearing of young (Hamilton and Hamilton 1965, Gaines and Laymon 1984, Rosenberg et al. 1991). WYBCs have evolved larger eggs and thicker eggshells, which would help them cope with potential higher egg water loss in the hotter, dryer conditions (Hamilton and Hamilton 1965, Ar et al. 1974, Rahn and Ar 1974). A study on the South Fork Kern River showed that lower temperatures and higher humidity were found at nest sites when compared to areas along the riparian forest edge or outside the forest (Launer *et al.* 1990). Recent research on the lower Colorado River has confirmed that WYBC nest sites had significantly higher daytime relative

humidity (6–13% higher) and significantly lower daytime temperatures (2–4° F lower) than average forested sites (McNeil *et al.* 2011, McNeil *et al.* 2012).

Subsurface hydrologic conditions are equally important to surface water conditions in determining riparian vegetation patterns. Depth to groundwater plays an important part in the distribution of riparian vegetation and WYBC habitat. Where groundwater levels are elevated so riparian forest trees can access the water, habitat for nesting, foraging, and migrating WYBCs can develop and thrive. Goodding's willows (*Salix gooddingii*) and Fremont cottonwoods do not regenerate if the groundwater levels fall below 6 ft (Shafroth *et al.* 2000). Goodding's willows cannot survive if groundwater levels drop below 10 ft, and Fremont cottonwoods cannot survive if groundwater drops below 16 ft (Stromberg *et al.* 1996). Abundant and healthy riparian vegetation decreases and habitat becomes stressed and less productive when groundwater levels are lowered (Stromberg *et al.* 1996).

Conditions for Germination and Regeneration of Riparian Zone Trees

The abundance and distribution of fine sediment deposited on floodplains is critical for the development, abundance, distribution, maintenance, and germination of trees in the riparian zone that become WYBC habitat. These sediments become seedbeds for germination and growth of the riparian vegetation upon which WYBCs depend. These sediments must be accompanied by sufficient surface moisture for seed germination and sufficient ground water levels for survival of seedlings and saplings (Stromberg 2001). The lack of hydrologic processes, which deposit such sediments, may lead riparian forested areas to senesce and become degraded and unable to support the varied vegetative structure required for WYBC nesting and foraging.

Arizona

At present, it appears that the State's population could be as low as 170 pairs of WYBCs, and probably does not exceed 250 pairs. The population of the WYBC in Arizona is the largest in the United States (USFWS 2013b).

The WYBC was historically widespread and locally common in Arizona (Phillips *et al.* 1964, Groschupf 1987). Although Arizona probably contains the largest remaining WYBC population among states west of the Rocky Mountains, the population has reportedly declined significantly in distribution and abundance over the past 80 years (Corman and Wise-Gervais 2005). During Arizona Breeding Bird Atlas surveys, nesting birds were found to be concentrated in western, central, and southeastern Arizona. According to Corman and Wise-Gervais (2005), WYBCs were found along most of the 25 drainages where they were reported historically but they are now much more local in distribution. It is believed that the San Pedro River likely sustains the largest single remaining population of WYBCs (Brand *et al.* 2009).

In a survey in 1999 that covered 265 mi (426 km) of river and creek bottoms (a subset of statewide WYBC habitat), 172 WYBC pairs and 81 single birds were located in Arizona (Corman and Magill 2000). WYBC populations greater than 10 pairs are found at 12 locations in Arizona: Bill Williams River, Colorado River, Gila River, Upper Cienega Creek, Hassayampa River, San Pedro River, Santa Maria River, Verde River, Sonoita Creek, Santa Cruz River, Altar Valley, and Agua Fria River. Sites with smaller populations are found at the Roosevelt Lake complex, Upper Tonto Creek, Pinto Creek, Sycamore Creek in Pajarito

Mountains, Oak Creek, Lower Cienega Creek, Babocomari River, Pinal Creek, Bonita Creek, San Bernardino NWR, Hooker Hot Springs, Big Sandy River, and many smaller drainages. However, many drainages have not been thoroughly surveyed and it is likely that some additional WYBC locations will be discovered. These include, but are not limited to the mountain ranges of southeastern Arizona, Eagle Creek, and along the Gila, San Francisco, and Blue Rivers. WYBC sightings reported by birders between 15 June and 31 August, 1998 to 2014, in more than one year in southeastern Arizona mountain ranges include Box, Walker, Madera, and Montosa canyons in the Santa Rita Mountains; Carr Canyon, Ash Canyon, Garden Canyon, Ramsey Canyon, and Miller Canyon in the Huachuca Mountains; Scotia Canyon and Sycamore Canyon in the Atascosa/Pajarito Mountains; French Joe Canyon in the Whetstone Mountains; Kitt Peak on Baboquivari Mountain; Harshaw Canyon and Paymaster Spring in the Patagonia Mountains; and a few locations in the Chiricahua Mountains (Cornell Laboratory of Ornithology 2012). WYBC are breeding in at least some of these locations, with nests confirmed at Sycamore Canyon, Box Canyon, and Kitt Peak (American Birding Association 2014; Sebesta pers comm 2014; AGFD, unpublished data).

Arizona Sites with at Least 10 Years of Survey Data

Bill Williams River — In the mid-1970s, an estimated 57 pairs of WYBCs bred in the riparian forest of the Bill Williams River delta (Gaines and Laymon 1984). Following the sustained high water levels of 1983 to 1984 and 1986, which inundated and killed most of the cottonwoods and willows along the Colorado River, WYBC numbers also declined on the Bill Williams River delta where similar habitat mortality occurred (Rosenberg *et al.* 1991). In 1987, 17 pairs of WYBCs were located at this site and a total of 25 to 30 pairs estimated to be present (Laymon and Halterman 1987a). Surveys were conducted regularly at this site from 1993 to 2002. The breeding population fluctuated from a low of 6 to 9 pairs in 1999 to a high of 28 to 39 pairs in 2001 (Halterman 2003). In 2010, 12 to 31 pairs were estimated, and the most recent survey in 2011 estimated 9 to 23 pairs (McNeil *et al.* 2010, McNeil *et al.* 2012). Bill Williams River NWR is considered the largest, highest quality stand of suitable habitat for the WYBC along the lower Colorado River (Johnson *et al.* 2008a). Data from this site show an important, but fluctuating, breeding population that has not recovered to 1977 levels.

Lower Colorado River — The lower Colorado River on the California-Arizona border supported an estimated 180 WYBC pairs in 1976 to 1977 (Gaines and Laymon 1984), a number that had declined an estimated 80 to 90 percent by 1986 (Laymon and Halterman 1987). In 2010, based on intensive surveys, 8 to 18 pairs were estimated, and a survey in 2011 estimated 9 to 23 pairs on the Arizona side of the Colorado River, excluding the Bill Williams River (McNeil *et al.* 2010, McNeil *et al.* 2012). Recent population estimates are well below the breeding population in 1977, even though more area was surveyed.

Upper San Pedro River — The San Pedro River supports one of the largest remaining populations of WYBCs in the western U.S. (Brand *et al.* 2009). Krueper (1993) provides data on the density of WYBCs and other obligate riparian songbirds in the San Pedro Riparian National Conservation Area between 1986 through 1991, during which grazing was retired in 1987, and understory vegetation increased significantly.

Sonoita Creek — A 4-mi (6-km) segment of Sonoita Creek was surveyed seven years between 1976 and 1986 (Groschupf 1987). WYBC pairs were not estimated, but lows of 5 and 6 individuals were found in 1976 and 1986, respectively, and highs of 24 to 28 individuals were found between 1977 and 1979. The site was surveyed again in 1998 and 1999, with 11 to 12 pairs and 8 to 9 single WYBCs located (Corman and Magill 2000). In 2005, 17 individuals were found while conducting bird surveys for Important Bird Area designation (Arizona Audubon 2012, http://iba.audubon.org/iba). This population, while fluctuating, does not appear to have decreased in size from 1976 to 2005.

Verde River—Surveys conducted in 2004 and 2005 at 37 sites within the Verde River watershed were done at historical sites (16) where WYBCs were previously detected in 1998 to 1999 and at random sites (21) with riparian forest that appeared to be suitable nesting habitat (Holmes *et al.* 2008). In the 2 years, 59 percent of sites had detections; 75 percent of historical sites and 48 percent of random sites (Holmes *et al.* 2008). Holmes *et al.* (2008) confirmed nesting at five sites and found evidence of probable breeding at nine additional sites. The maximum number of detections during any one survey period was 23 in 2004 and 31 in 2005.

Threats

The WYBC is threatened by two of the five threat factors evaluated (A and E).

Factor A. The Present or Threatened Destruction, Modification, or Curtailment of Its Habitat or Range

Within the three States with the highest historical number of WYBC pairs, past riparian habitat losses are estimated to be about 90 to 95 percent in Arizona, 90 percent in New Mexico, and 90 to 99 percent in California (Ohmart 1994, U.S. Department of Interior 1994, Noss *et al.* 1995, Greco 2008).

The primary threat to the WYBC is loss or fragmentation of high-quality riparian habitat suitable for nesting (Corman and Wise-Gervais 2005). Habitat loss and degradation from several interrelated factors include alteration of flows in rivers and streams, encroachment into the floodplain from agricultural and other development activities, stream channelization and stabilization, diversion of surface and ground water for agricultural and municipal purposes, livestock grazing, wildfire, establishment of nonnative vegetation, drought, and prey scarcity due to pesticides (Ehrlich *et al.* 1992, Wiggins 2005, USFWS 2013b). Drought and prey scarcity (especially the loss of sphinx moth caterpillars to pesticides in the West) appear to play a role in yellow-billed cuckoo declines even where suitable nesting habitat remains (Ehrlich *et al.* 1992). These factors also contribute to fragmentation and promote conversion to nonnative plant species and increased incidence of wildfire (Krueper 1993; USFWS 2001, 2013b). A potential factor contributing to declines across the species' range in North America is the loss of forested habitat on its wintering grounds in South America where little is known of its ecology or distribution (Ehrlich *et al.* 1992). The threats affecting WYBC habitat are ongoing. Such a loss of riparian habitat leads not only to a direct reduction in WYBC numbers but also leaves a highly fragmented landscape, which can reduce breeding success through increased predation rates and barriers to dispersal by juvenile and adult WYBCs (USFWS 2013b).

Factor E. Other Natural or Manmade Factors Affecting Its Continued Existence

Factor E threats, including habitat rarity and small, isolated populations of the WYBC, cause the remaining populations in western North America to be increasingly susceptible to further declines through lack of immigration, chance weather events, fluctuating availability of prey populations, pesticides, collisions with tall vertical structures during migration, spread of the introduced tamarisk leaf beetle (*Diorhabda* spp.) as a biocontrol agent in the Southwest, and climate change. The ongoing threat of small overall population size leads to an increased chance of local extirpations through random events (Thompson 1961, McGill 1975, Wilcove *et al.* 1986).

Habitat for the WYBC has been modified and curtailed, resulting in only remnants of formerly large tracts of native riparian forests, many of which are no longer occupied by WYBCs. Despite recent efforts to protect existing, and restore additional, riparian habitat in the Sacramento, Kern, and Colorado Rivers, and other rivers in the range of the WYBC, these efforts offset only a small fraction of historical habitat that has been lost. Therefore, we expect the threat resulting from the combined effects associated with small and widely separated habitat patches to continue to affect a large portion of the range of the WYBC. This threat is particularly persistent where small habitat patches are in proximity to human-altered landscapes, such as near agricultural fields that dominate the landscape in many areas where the WYBC occurs. As a result, the potential exists for pesticides to directly affect (poisoning individual WYBCs) and indirectly affect (reducing the prey base) a large portion of the species. These effects could ultimately result in lower population abundance and curtailment of its occupied range. Mortality from collisions with tall structures is also an ongoing, but largely unquantified effect. We recognize that climate change is a critical issue with potentially severe wide-ranging effects on the species and its habitat. The available scientific literature suggests that the effects of climate change will likely exacerbate multiple existing threats to the WYBC and its habitat.

Proposed Critical Habitat

The primary constituent elements of proposed critical habitat are based on riparian plant species, structure and quality of habitat and an adequate prey base.

1. Primary Constituent Element 1— *Riparian woodlands.* Riparian woodlands with mixed willow-cottonwood vegetation, mesquite-thorn forest vegetation, or a combination of these that contain habitat for nesting and foraging in contiguous or nearly contiguous patches that are generally greater than 325 ft in width and 200 ac or more in extent. These habitat patches contain one or more nesting groves, which are generally willow-dominated, have above average canopy closure (greater than 70 percent), and have a cooler, more humid environment than the surround riparian and upland habitats.
2. Primary Constituent Element 2—*Adequate prey base.* Presence of a prey base consisting of large insect fauna (for example, cicadas, caterpillars, katydids, grasshoppers, large beetles, dragonflies) and frogs for adults and young in breeding areas during the nesting season and in post-breeding dispersal areas.
3. Primary Constituent Element 3—*Dynamic riverine processes.* River systems that are dynamic and provide hydrologic processes that encourage sediment movement and deposits that allow seedling germination and promote plant growth, maintenance, health, and vigor (e.g. lower gradient streams and broad floodplains, elevated subsurface groundwater table,

and perennial rivers and streams). This allows habitat to regenerate at regular intervals, leading to riparian vegetation with variously aged patches from young to old.

The physical and biological features of WYBC proposed critical habitat are the principal biological or physical elements essential to WYBCs conservation which may require special management considerations or protection (USFWS 2014b). The proposed critical habitat rule identifies the following physical or biological features of WYBC habitat to include (USFWS 2014b):

1. Rivers and streams of lower gradient and more open valleys with a broad floodplain.
2. Presence of abundant, large insect fauna (for example, cicadas, caterpillars, katydids, grasshoppers, large beetles, and dragonflies) and frogs during nesting season.
3. Flowing rivers and streams, elevated subsurface groundwater tables, and high humidity.
4. Flowing perennial rivers and streams and deposited fine sediments.
5. Riparian trees including willow, cottonwood, alder (*Alnus* sp.), walnut (*Juglans* sp.), sycamore (*Platanus* sp.), boxelder (*Acer* sp.), ash (*Fraxinus* sp.), mesquite, and tamarisk that provide cover and shelter for foraging and dispersing WYBCs.
6. Blocks of riparian habitat greater than 200 ac in extent and greater than 325 ft in width, with one or more densely foliaged, willow-dominated nesting sites and cottonwood-dominated foraging sites.

ENVIRONMENTAL BASELINE

The action area for the proposed action includes all areas directly and indirectly affected by the proposed action, including effects of actions that are interdependent and interrelated to the proposed action. The action area includes all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR §402.02). 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.

Description of the Action Area

The action area consists of all eight proposed vegetation management sites, access routes to the vegetation management sites (as yet undeveloped), staging areas, and cutting collection areas. Since many of the vegetation management sites are surrounded by similar habitat there may be effects from habitat removal that extends the action area beyond the vegetation management site boundaries. The vegetation management sites are linked by and would be accessed from existing paved and unpaved roads, requiring no modifications by the project, and are therefore not included in the action area.

A. STATUS OF THE SPECIES AND CRITICAL HABITAT WITHIN THE ACTION AREA

Southwestern willow flycatcher

USFWS-protocol (Sogge et al. 2010) surveys for SWFL presence/absence were conducted across all eight vegetation management sites from 2014 to 2016 (Johnson and Calvo 2015, Johnson pers. com 2016). Also, SWFL nests were also sought out advantageously. The surveys covered an area larger than each vegetation management site. Not all vegetation management sites were

surveyed in their entirety in any single season. But, with the exception of R10 (40.2 acres), all other management sites had known flycatcher territories and nests. Overall, the number of known SWFL territories detected from the surveys increased annually from 31 in 2014, 40 in 2015, and 69 in 2016. Similarly, detected nests increased each season from 15 in 2014, 29 in 2015, and 37 in 2016. By using the most recent recorded information from each management site, a total of 95 SWFL territories are estimated to occur within the action area following the end of the 2016 season (R3=23, R4=41, R8=5, R9/10=6, R11=3, R14=9, R18=8). With no consideration for the nuances or territory configuration, overlap or any other complexity, 95 territories in 291 acres, represents about 3 acres per territory. Please refer to Table 4 for detailed SWFL survey data.

Table 4. Total number SWFL nests and territories located at 8 vegetation management sites within action area from 2014-2016, upper Gila River, AZ.

Site	**Acres WIFL Habitat/ Total Site Acres**	**Total Number of SWFL Territories per Site**	**SWFL Nests per Site (2014/2015/2016 results)**	**# Re-nest Attempts per Site**
R3	52.7/61.6	2014 = 11 2015 = 23	2014 = 7 2015 = 17	2015 = 6
R4	16.3/31.1	2016 = 41	2016 = 18	2016 = 3
R8	4.5/9.3	2014 = 6 2015 = 4 2016 = 5	2014 = 2 2015 = 2 2016 = 4	2014/15 = 0 2016 = 1
R9 (R/10)	74.4/114.5	2015 = 9 2016 = 6	2015 = 6 2016 = 3	2015/16 = 0
R11	5.3/28.7	2014 = 3	2014 = 1	0
R14	55.5/61.9	2014 = 7 2016 = 9	2014 = 3 2016 = 8	2014 = 0 2016 = 1
R15	40.2/40.2	0	0	0
R18	42.6/63.4	2014 = 4 2015 = 4 2016 = 8	2014 = 2 2015 = 4 2016 = 4	2014 = 0 2015 = 2 2016 = 1
Totals	**291.5/ 410.9**	**2014 = 31 2015 = 40 2016 = 69**	**2014 = 15 2015 = 29 2016 = 37**	**2014 = 0 2015 = 8 2016 = 6**

Sources of disturbance were assessed by Johnson and Calvo (2015), who found that roads and cattle were located at all six surveyed sites within the action area. They found that the 74 percent of the SWFL nests were at least 164-328 ft from some type of disturbance, 8 percent were between 98-131 ft away and another 8 percent were 66-98 ft away from the nest. The most common impact noted near SWFL nests were cattle evidence (i.e. trails and scat) and cattle presence and which were common in sites R3, R8, R10 and R14 (Johnson and Calvo 2015). Recreational activity was also observed at all sites either from people fishing, hunting and the using ATVs (Johnson and Calvo 2015). ATV impact, in particular, has remained high at site

R18. Site R26 had the least amount of impact, yet trails and roads existed throughout the site (Johnson and Calvo 2015).

At surveyed sites in 2015, the brown-headed Cowbird (*Molothrus ater*) brood parasitism rate was 11 percent (Johnson and Calvo 2015). Specifically, brood parasitism was observed at sites R3 (13%), R8 (4%) and R10 (8%) (Johnson and Calvo 2015). Brood parasitism is relatively low on this section of the Gila River compared to other SWFL populations in the southwest (Johnson and Calvo 2015). During SWFL surveys and nest searching, brown-headed cowbirds were incidentally observed within each site. The highest number were detected at sites R18 (n = 28), R26 (n = 22) followed by R10 (n = 18).

Designated critical habitat for the SWFL occurs from the upper end of Earven Flat in Arizona, above the Town of Safford, through the Safford Valley to the San Carlos Apache tribal boundary in Gila, Graham, and Pinal Counties, Arizona. All eight vegetation management sites occur within designated critical habitat. The area contains sufficient physical or biological features including PCEs 1 (riparian vegetation) and 2 (insect prey populations). Hatten (2016, Table 3) satellite-based modeling found that predicted SWFL breeding habitat within the Upper Gila Management Unit grew in amount from 2013 to 2015 by 41 percent.

Western yellow-billed cuckoo

Within the action area there is limited information on WYBC distribution and abundance. In 2014, 20 total WYBC detections (visual and vocalizations) were recorded incidental to the SWFL protocol surveys (Sogge et al. 2010). In 2015, protocol surveys were conducted at six of the eight vegetation management sites (Halterman et al. 2015). Four surveys detected a total of 26 WYBC at the surveyed sites (Johnson and Calvo 2015). Sites R3 (n = 7) and R26 (n = 7) had highest number of detections followed by R18 (Johnson and Calvo 2015). All sites surveyed in 2015 had WYBC detections with the exception of site R8, which is dominated by tamarisk with very little native vegetation (i.e. cottonwood/willow) (Johnson and Calvo 2015). Sites R10 and R14 both had fewer WYBC detections, which may be due to the limited amount of native vegetation (i.e. cottonwood/willow) and the dominance of tamarisk (Johnson and Calvo 2015). No WYBC nests were located in 2015 at any of the surveyed sites, nor was any breeding behavior (i.e. nest building, copulation) but nest searching and behavior were not the focus of these surveys. However, WYBC were observed calling to each other and pairs were observed during three different observations (Johnson and Calvo 2015).

Table 5. Total number of WYBCs detected per survey site at Gila River, AZ, 2015. R11 was not designated as a vegetation management site in 2016 and was accidently surveyed and had 2 WYBC detections. Only six of the eight vegetation management areas were surveyed in 2015.

Site	Survey 1	Survey 2	Survey 3	Survey 4	Total Birds Detected per Site
R3	**3**	**3**	**1**	**0**	**7**
R8	**0**	**0**	**0**	**0**	**0**
R10	**1**	**1**	**0**	**0**	**2**
R14	**1**	**1**	**1**	**0**	**3**
R18	**3**	**1**	**1**	**0**	**5**
R26	**2**	**2**	**2**	**1**	**7**

Total Birds Detected per Survey	**12**	**8**	**5**	**1**	**26**

Available habitat in the action area consists primarily of tamarisk shrublands, with small patches of cottonwood-Goodding's willow woodland. The only areas where WYBC were detected in 2014, within the action area, are those with mature cottonwoods and willows with a tamarisk/willow understory, which are near R3 and R14. Such areas have a high canopy and multi-layered understory. WYBCs in the action area are most likely to nest or be detected in various associations of cottonwood, willow, velvet ash (*Fraxinus velutina*), Arizona walnut (*Juglans major*), mesquite, and tamarisk. At the landscape scale, home ranges may vary in size depending on seasonal food abundance, and the territories of nesting pairs may overlap one another.

Previous to 2014, the only observations since 2005 have been at the Fort Thomas Preserve, which is owned and managed by Salt River Project (SRP) and the Bureau of Reclamation (Reclamation) and is approximately half way between vegetation management sites R11 and R14. Suitable breeding habitat in the Fort Thomas Preserve consists of multi-layered riparian vegetation patches of various sizes that are linked by stream channels or irrigation drainages. Habitat ranges from mixed-native (51–75% native tree species) to nonnative-dominated (>75% nonnative tree species). Surveys in mixed native and nonnative habitat on the southern portion of the Fort Thomas Preserve yield significantly more WYBC detections than have tamarisk–dominated survey routes to the north. Surveys in 2007 recorded 76 detections, a dramatic increase from those reported in 2005 (two detections) and 2006 (three detections) (Johnson *et al.* 2006a, b). Possible explanations include natural population fluctuations, an increase in survey effort, survey effort shifting focus to higher quality habitat, or a combination of factors. Population numbers in the eastern United States are highly variable depending on food availability (Eaton 1988) and western populations may fluctuate similarly. In 2007, breeding pairs were concentrated on the southern portion of the preserve in native-dominated gallery forests. In 2009, 66 WYBC detections were recorded for the Fort Thomas Preserve study area over four separate protocol surveys. Twenty incidental detections were also recorded. Results of the surveys and observations indicated that five to seven pairs were present in the study area. In 2012, only 22 detections were recorded in the Fort Thomas Preserve surveys, with data suggesting that only five to six pairs were present in the study area.

The proposed critical habitat unit for WYBC occurs along the Gila River in the action area and begins approximately 12 mi upstream of Safford and continues 66 miles downstream to the San Carlos Reservoir. All five vegetation management sites occur within designated proposed critical habitat. The area contains sufficient physical or biological features including PCEs 1 (riparian woodlands), 2 (adequate prey base), and 3 (dynamic riverine processes). However, flows in the action area are strongly influenced by several in-channel irrigation diversions, bridge crossings, and agricultural levees which affect the dynamic riverine processes.

In 2015, the WYBC habitat suitability was modeled for the vegetation management sites (Hatten unpubl. data). The model rates habitat suitability on a scale of 1 to 5, with 5 being the most suitable. There are 4,054 acres of WYBC habitat with suitability ratings of 3, 4, or 5 in the

vicinity of the modified vegetation management sites (i.e., from Site R3 and the San Jose Diversion Dam). The modified vegetation management sites contain 354.3 acres of WYBC breeding habitat with suitability ratings of 3, 4, or 5 (Table 8).

Table 6. Acres of modeled suitable WYBC breeding habitat at the modified treatment sites.
[1] Area with habitat suitability rating of 3, 4, or 5.

Restoration site	Site size (acres)	Acres of suitable habitat[1]
R3	61.6	60.2
R4	31.1	28.6
R8	9.3	9.3
R9	114.5	95.7
R11	28.7	5.0
R14	61.9	60.0
R15	40.2	40.2
R18	63.4	55.3
Access roads	1.7	0.7
Total	412.6	355.0

B. FACTORS AFFECTING SPECIES ENVIRONMENT WITHIN THE ACTION AREA

The action area surrounding the vegetation management sites occurs within about a 23 mile stretch of the Safford Valley along the Gila River, from north Main Street between Pima and Bryce downstream to Geronimo (see Figure A1). Along this segment of river and within the action area, the river is a low-gradient, braided, meandering channel bordered by a broad floodplain. The floodplain that contains the riparian area generally ranges in width from 1,000 to 4,600 feet, and typically narrows where it encounters mountain-front cliffs and coalesced alluvial fans (bajadas). In the action area, the riparian forest is generally densely vegetated, with mixtures of tamarisk and native woody vegetation. Outside of the immediate floodplain, the sites are bordered by farmland, Sonoran Desert, and several towns and surrounding communities. During low flow periods, the river is a narrow single-thread channel that may be intermittently dry in some portions of the action area. During periods of greater flow, side-channels also convey flow giving a more pronounced braided appearance to the river corridor. The entire corridor can become inundated during the largest floods.

The majority of the Safford Valley floor is privately owned, and cotton farming has been the dominant land-use activity since the mid-20th century. While much of the area is sparsely developed, the largest urban center (and County Seat) is in Safford, which supports a growing population of around 10,000 people according to the 2010 U.S. Census. Much of the upland areas are held by BLM. In recent years, several parcels overlapping the river corridor have been purchased by Freeport McMoRan Copper & Gold (FMI; formerly Phelps Dodge Corporation) to serve as mitigation sites. The SRP also manages a group of mitigation parcels near Fort Thomas called the Fort Thomas Preserve.

Hydrology

In most of the project action area, the Gila River exhibits perennial flow (the river at vegetation management site R14 can go dry). These flows are punctuated by flashy runoff events during winter and spring storms and summer monsoons. Daily flows in a given water year average about 400 cubic feet per second (cfs) in the upper Gila River valley (from gages near Solomon and at Calva), but decrease along its length, likely due to human water-uses (e.g., diversions, wells) and riparian vegetation water use. Mean daily flows in the valley are typically less than about 1,000 cfs for 90 percent of the time (as recorded at both gages), and less than 100 cfs and 10 cfs for 10 percent of the time near the upstream and downstream ends of the valley (as recorded near Solomon and at Calva), respectively. The month of March typically experiences the highest mean monthly flows over a given water year, and August experiences the highest flows from Summer through Fall. Annual peak flows in the Safford Valley can be characterized as "flashy": they are massive in comparison with the mean daily flows (e.g., 453 cfs versus 132,000 cfs), but usually span only a few hours to days. These flashy discharge dynamics, which are common to large, dryland riverine systems, periodically result in dramatic geomorphic change. The amount of surface flow and the location of the river channel in the action area are also be strongly influenced by several in-channel irrigation diversions, bridge crossings, and agricultural levees.

Seasonal agricultural run-off directly influences the right/north bank of vegetation management site R18. There is an agricultural run-off return-flow ditch that discharges directly into this area during the irrigation season and an abundance of very dense riparian and wetland vegetation along the discharge. Other vegetation management sites are likely indirectly influenced by seasonal agricultural run-off. For example, a tributary discharges seasonally into the left/south bank of site R18 that is likely a combination of tributary flow, road-runoff, and agricultural return flows; site R14 is directly adjacent to a seasonally irrigated field with ditches that may discharge run-off into the site occasionally; sites R11, R8, and R3 are not adjacent to agricultural lands, but may be influenced by river flows that are seasonally augmented by agricultural return-flows upstream.

Vegetation

The most common vegetation type in the action area is tamarisk-dominated shrubland, which is found under a relatively wide range of conditions. The abundance of tamarisk ranges throughout the action area, to areas where it is nearly the only woody species present, to other stands where there are greater mixtures of tamarisk, cottonwood, Goodding's willow, and other native riparian shrubs. Vegetation density can range widely, from nearly continuous to only 10 percent tamarisk cover, and canopy heights are typically no more than 16 feet. Dense stands of tamarisk near flowing and standing water or very moist soils are the primary nesting habitat of SWFL in the action area. The herbaceous layer in tamarisk-dominated shrublands is low in floristic diversity, comprised mostly of a sparse cover of nonnative bermuda grass (*Cynodon dactylon*) or johnsongrass (*Sorghum halepense*). Tamarisk can tolerate a wide variety of soil conditions, flood and scour frequencies, increased groundwater depths, and are found from stream banks to more mesic upland areas. Tamarisk is highly flammable and has fueled a number of fires in the action area. In areas burned by the Clay Fire in March 2013 near Fort Thomas, nearly all of the

tamarisk biomass was burned away, but just a year later all burnt tamarisk trees were observed to be re-sprouting vigorously from the base.

There are also stands of cottonwood-Goodding's willow woodland in the action area, typically along the outer margin of the riparian corridor and the banks of abandoned and/or high flow channels, which form a dense, high canopy 15–30 ft tall. In the action area, most cottonwood and Goodding's willow trees are mature or decadent appearing to have been established soon after the 1993 and 1995 flood events, and there appears to be very little to no recent natural recruitment of either species. Tamarisk, and less often mesquite, still dominates the sub-canopy in these stands. In general, the herbaceous layer is very sparse to absent and the ground layer has a moderate cover of downed wood and other organic litter. Cottonwood-Goodding's willow woodland typically occurs where substrates are silty or sandy, and generally dry, and at elevations where they are frequently inundated by lower velocity floods but are not subject to intense scouring. Cottonwood-Goodding's willow woodlands are important habitat for WYBC.

Mixed riparian shrubland and narrowleaf willow-mulefat shrubland are found along the river banks in the action area. A combination of tamarisk, mulefat, and/or narrowleaf willow typically dominate the shrub layer, while bermudagrass, sacaton, and/or johnsongrass may occur at low cover in the herb layer. The tree layer is nearly always absent, although Goodding's willow can occasionally occur at low cover. Typically 30–40 percent of the area is unvegetated sand or silt. These vegetation types occur along the active channel, as well as side channels, on silty, typically moist substrates, where they are frequently inundated, in more or less continuous narrow, sparse strips (see the riverbanks in photo insert at right). In many instances, these vegetation types appear to be limited in extent as a result of shading from adjacent and taller-stature tamarisk-dominated shrublands.

The occurrence of specific riparian plant species exotic (tamarisk), native (willow and cottonwood), or mixtures of the both within the action areas is largely a product of the underlying landscape conditions of the river (USGS 2010, USFWS 2002). In other words, tamarisk flourishes largely because anthropogenic stressors degrade conditions favorable to establishment of native trees and improve conditions favorable for tamarisk (Stromberg *et al.* 2005). The distribution and abundance of tamarisk is symptomatic of the more difficult and broader issue of land and water management and should be considered within the context of the underlying physical and biological processes that shape the ecosystem (Stromberg *et al.* 2005). Upstream water use combined with surface water diversions and groundwater pumping surrounding the action area in the Safford Valley are likely significant factors that create favorable conditions for tamarisk, while adversely affecting conditions where native plants can thrive. Additionally, agricultural return-flow during the spring and summer months, when tamarisk is becoming established, creates further advantageous conditions for tamarisk (USFWS 2014c).

Review of Previous 50-acre Vegetation Management Results

Monitoring plots were established at R18 on the north and south banks, as this was the most completely treated site before the April 15th cut-off date. Thus, it experienced a full growing season, which allowed for both natural recruitment, and re-sprouting of the treated tamarisk stumps. The plots that were treated on the north bank of R18 (Class 3 tamarisk) averaged 1,355

tamarisk stumps per acre. The plots that were treated on the south bank of R18 (Class 3 tamarisk) averaged 4,065 tamarisk stumps per acre. From those stumps on the north bank, an average of 1,537 re-sprouts were observed coming back from the stump and/or recruiting. From those stumps on the south bank, an average of 4,162 re-sprouts were observed coming back from the stump and/or recruiting. Therefore, the tamarisk treatment protocol was adapted to stress the need to "low-stump" the tamarisk, such that the herbicide is able to absorb into the root crown which should improve effectiveness.

Passive re-establishment of native plant species was more rapid than anticipated at the initial vegetation management sites. A first effort at documenting this re-establishment of native species involved mapping "recruitment events". "Recruitment event" is defined as the establishment of greater than 100 stems of native riparian obligate tree species that are taller than 6 feet, in an area less than 0.25 acres. According to these metrics, two such events have occurred on the north bank of R18. A *Populus fremontii* recruitment event occurred when 146 cottonwood trees, ranging between 6 and 12 feet tall, established on a 0.33 acre area (equivalent to 111 trees per 0.25 acres). A *Salix exigua* recruitment event occurred when 126 coyote willow trees, ranging between 6 and 8 feet tall, established on a 0.01 acre area (equivalent to 3,150 trees per 0.25 acres).

As of December 2015, a high rate of planting success for the container stock introduced from the GWP Native Plant Nursery has been observed, but much less success of the pole plantings that were placed in early March of 2015. The container stock may have had higher success due to the planting zones and the strategic timing of the plantings to coincide with rain events. The lower success of the pole planting may have been due to the use of the water auger not allowing for the accurate determination of whether the poles were being planted in the water table, and possibly because many of the trees from which we were harvesting poles had begun to come out of dormancy when we were trying to plant (and thus were focusing energy on producing foliage as opposed to root growth).

The preliminary monitoring results from this past year suggest there is uncertainty whether the project is on a trajectory to achieve its project goals and objectives. Natural recruitment may assist in establishing dense stands of native riparian tree species 9-19 feet tall, which will be supplemented by the proposed project through introducing additional species that may not naturally recruit as well (*Salix gooddingii*, *Sporobolus airoides*, *Prosopis velutina*, *Lycium torreyi*, *etc*.). However, many tamarisk plants re-sprouted at the treated sites compared to those that were removed. We have no information yet about the configuration, density, or persistence of plants and plant species in the near future or distant future, or to what extent breeding SWFL may use these management sites. Between natural processes (floods, drought) and the vegetation management proposed, there is still uncertainty to what extent these efforts will provide short-term or long-term benefits for SWFLs ,Western yellow-billed cuckoos and their designated and proposed critical habitats.

Tamarisk Leaf Beetle

Hatten (2016) applied satellite modeling to predict the amount and distribution of potential SWFL breeding habitat across the southwestern United States and evaluated potential impacts by the leaf beetle along the upper Gila River (including the Action Area). . Their findings

predicted a 53.1 percent loss of predicted flycatcher habitat for a 44 stream mile reach of the upper Gila River from the confluence with Bonita Creek downstream to Goodwin Wash (4.35 stream miles downstream of Fort Thomas) (Hatten 2016).

EFFECTS OF THE ACTION

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

Southwestern Willow Flycatcher

The project is being implemented by the Gila Watershed Partnership in anticipation of the impending arrival of the tamarisk leaf beetle, which defoliates and kills the nonnative tamarisk that currently provides nesting habitat for SWFLs in the project area. One of the goals of the project is to improve habitat to benefit SWFL populations, which absent the project would be expected to be impacted by the unavoidable effects caused by the tamarisk leaf beetle. However, short-term adverse indirect effects to the SWFL and its critical habitat are expected to occur as a result of the project.

The proposed conservation measures are anticipated to be effective in reducing the adverse effects of the proposed action. Scheduling vegetation removal activities during the October 1 to April 14 work period will avoid direct effects during the nesting season, while SWFLs are on their wintering grounds in Central America or northern South America. Therefore, no direct impacts to SWFLs, their nesting attempts, eggs or young are expected to occur. Avoiding habitat removal within the immediate area surrounding known SWFL nest areas and minimizing clearing access routes within occupied or highly suitable habitat, will minimize, but not eliminate indirect SWFL impacts.

Riparian habitat in the Southwest is naturally rare and patchy, occurring as widely separated ribbons of forest in a primarily arid landscape. In Arizona, for example, riparian habitat comprises less than 0.5 percent of the landscape (Strong and Bock 1990). Wide-ranging or highly mobile species that rely on naturally patchy habitats, such as the SWFL, persist at regional scales as meta-populations, or local breeding groups that are linked together and maintained over time through immigration and emigration (Pulliam and Dunning 1994, USFWS 2002). SWFLs, as neo-tropical migrants, have high site fidelity to the location of breeding patches, returning to the same areas to breed annually (USFWS 2002). It is anticipated that the individuals that established nest territories in 2016 would return in 2017. Persistence of local breeding groups is a function of the group's size (numbers of individuals) and the ability of individuals to disperse from one breeding location to another.

Tamarisk removal, clearing of new access routes, and selective clipping of willow and cottonwood cuttings for propagation may temporarily and indirectly affect SWFL habitat through the short-term loss of nesting and/or foraging habitat, between the time of tamarisk removal and sufficient growth of

native vegetation. Decreased cover due to clearing of tamarisk may increase rates of nest predation and brood parasitism by cowbirds, reducing the suitability of nesting habitat. Creating gaps in vegetation may increase temperatures and lower relative humidity in the habitat patches, reducing the success of egg hatching, productivity of insects and therefore the overall suitability of nesting and foraging habitat. The replacement of habitat structure lost by removing tamarisk by native vegetation is expected to take approximately five years. The short-term effects to nesting SWFLs and the number of territories by the removal of habitat within the action area will be minimized by the re-establishment of native woody plant species (primarily willow) within these management sites. Project site selection identified that these management sites have a greater likelihood of being able to grow native species due to appropriate soil and groundwater conditions.

Removal of tamarisk at the modified vegetation management sites and establishing new access routes will occur within a maximum 400 acre area where migrant willow flycatchers may occur. The removal of riparian habitat within these disconnected eight vegetation management areas remains a relatively small fraction of the overall amount of riparian habitat across this 23-mile segment of the upper Gila River. Because migrant SWFLs are able to take advantage of a much broader quality of riparian habitat for shelter, cover, and food and will use areas briefly as they move onto other locations, we do not anticipate significant impacts to occur to migrating SWFLs from this habitat removal over the life of the project. Therefore the overall small amount of Gila River habitat temporally affected by this project is not expected to substantially influence the overall quality of migration habitat or adversely affect migrating SWFL behavior. We expect they will utilize unaffected available habitat and take advantage of the new habitat that becomes established through planting or natural recruitment.

Within the overall 400 acre action area, there is an estimated 291.9 acres of habitat identified as suitable flycatcher breeding habitat. All of these areas have been surveyed since 2014, resulting in the most recent estimate of 95 territories in 2016. The amount of vegetation required by nesting flycatchers varies depending on the habitat quality. Salt River Project, when using the Arizona Game an d Fish Department and U.S. Geological Survey's (Hatten and Paradzick 2001) flycatcher habitat model, estimated that about 11 acres of vegetation overall is needed to support a single territory (USFWS 2003). Within that broader acreage of vegetation, flycatchers defend territories of various sizes ranging from 0.15 to 5.68 acres, with territories more typically ranging from 0.5 – 1.2 acres in size. Stillwater Science (2014) estimated the average SWFL nest territory size at 2.2 acres. Therefore depending on various seasonal conditions and degree of breeding site occupancy, we can only estimate how many flycatcher territories may be affected by the project. Using broad average estimates of 0.8 to 2.2 acres of riparian habitat defended per territory and if all suitable flycatcher breeding habitat within the Action Area were occupied, the modified project has the potential to affect 132 to 364 nest territories. However, a more site-specific estimate could be used based upon the 291.9 acreage surveyed within the project area and 95territories detected, which equals about 3.1 acres per territory. . Although many of those 291.9 acres contain native trees and shrubs, where only selective tamarisk removal will occur, or include the stream bank of the Gila River, which will be avoided.

A total of 95 territories were identified in about 73 percent of the overall modified vegetation management (291.9 acres of 400 total acreage) sites during 2014, 2015, and 2016 surveys (Johnson and Calvo 2015). It is likely SWFL habitat within these 400 acres will continue to change (improve or decline) in quality throughout implementation of the project, shifting the location and abundance of

territories within the action area. Continued surveys throughout the action area will help to identify these shifts in abundance and location throughout the project in order to best minimize impacts .

Given the nest site fidelity of SWFL, there is the likelihood that removal of tamarisk at identified nesting locations will adversely affect future breeding opportunities during the anticipated five-year native vegetation recovery window. The conservation measure which requires a 90-foot buffer around occupied nest sites will minimize, but not eliminate the risk of SWFL not returning to previously established nests. Prior to initiation of tamarisk removal within suitable SWFL nesting habitat, a qualified biologist will evaluate the site and identify areas to be avoided during project activities. Also, protocol surveys will be conducted for SWFL by a qualified and permitted biologist on an annual basis to assess project effects prior to tamarisk removal, and data collected during these surveys will be used to establish buffers around any new nest and territory locations.

While small buffers (90 ft) will be placed around known nests and territories, not all nests and territories may be known within the action area. SWFL habitat modeling based on remote sensing and GIS data found that breeding site occupancy is influenced by vegetation characteristics surrounding a territory (USFWS 2002). This same model was used to conclude that an 11.1-acre "neighborhood" was a reasonable estimate of habitat needed by adult and juvenile SWFLs for refuge and foraging near nests and territories (SRP 2002). Therefore, the removal of riparian habitat from these eight vegetation management areas is anticipated to remove vegetation from within SWFL territories, important habitat surrounding territory boundaries, and likely undetected areas used for nest placement. Based on SWFL breeding habitat suitability modeling (Section 4.2 of BA addendum), tamarisk removal at the modified vegetation management sites may temporarily affect no more than 8 percent of the total suitable SWFL breeding habitat in the action area. As such, while tamarisk removal and revegetation is occurring and developing at the modified vegetation management sites, there will remain a suitable amount of nesting habitat (approximately equivalent to 1,484 nest territories) in the action area for SWFL to naturally disperse to.

The PCEs of SWFL critical habitat, as described in the status of the species section, are those habitat elements that provide sufficient riparian habitat for breeding, non-breeding, territorial, dispersing and migrating SWFLs and to SWFLs throughout their range, and provide those habitat components essential for conservation of the subspecies. Short-term effects on PCEs are expected during the habitat vegetation management process, between the time of removal of tamarisk and the growth of sufficient structure of native vegetation. Overall, however, the project is intended (and explicitly designed) to improve SWFL habitat, which, absent the project, would be expected to be harmed by the unavoidable effects caused by the tamarisk leaf beetle**.** The project is expected to have short-term adverse effects on the PCEs of designated critical habitat, but in the longer term is intended to improve these PCEs and the overall quality of SWFL habitat.

The project is likely to cause temporary adverse effects to SWFLs and their critical habitat. Approximately 291.9 acres of suitable SWFL habitat will be temporarily affected by selective tamarisk removal and access route clearing activities. We can anticipate that throughout the implementation of the project, this total amount of suitable habitat will shift in quality. However, this anticipated temporary effect to the SWFL and its habitat needs, should be viewed in comparison to what would be expected if this habitat vegetation management project were not undertaken. In

the absence of this project, habitat loss or alteration over much of these acres is expected to occur due to the expected arrival of the tamarisk leaf beetle. This likely outcome would lead to the alteration of SWFL habitat and could impact the productivity of these territories. By completing this project in advance of the beetle's arrival, while abundant territories occur upstream and downstream of these management sites, the intent is to create more native dominated habitat which would be expected to reduce the impact of the leaf beetle. In contrast, waiting to implement this project following impacts from the beetle, when SWFL populations may be depressed, isolated, and with fewer individuals could increase the probability of local extinction (Pulliam and Dunning 1994, USFWS 2002). However, because this is a dynamic system with significant stressors (groundwater extraction, surface water diversion, cattle grazing, etc.), prone to devastating floods, the primary benefit of this project is expected to be short-term in nature and minimized once the next large flood event occurs. We anticipate the vegetation community and riparian plant species that will return following the floods will largely be reliant on the surrounding natural existing conditions (groundwater, watershed, soil, etc.) and the stressors that affect them (USFWS 2013, p. 351-355).

Western Yellow-billed Cuckoo

We present occupancy and habitat use data from the most recent WYBC surveys, above.

Vegetation management in the area may temporally change the habitat conditions at the vegetation management sites. Creating gaps in vegetation may increase temperatures and lower relative humidity in the habitat patches, reducing the success of egg hatching, productivity of insects and therefore the overall suitability of nesting and foraging habitat. The selective clipping of willow and cottonwood cuttings for propagation could also affect WYBC habitat, but conservation measures minimize the risk of negative impacts by limiting the amounts and locations of such cuttings. Clippings will be made either from areas within the vegetation management site or outside of WYBC habitat, irrigation ditches that contain stringers of vegetation.

The long-term effects to WYBC by the removal of habitat within the action area will be minimized by the re-establishment of native woody plant species (primarily cottonwood and willow) within these management sites in approximately five years. Project site selection identified that these management sites have a greater likelihood of being able to grow native species due to appropriate soil and groundwater conditions. As a result of this portion of the Gila River being unregulated, the impacts of this project are limited by the length of time until the next large flood event that removes and alters vegetation through this area.

Removal of tamarisk at the modified vegetation management sites and at new access routes will occur on a maximum of 355.0 acres (354.3 acres in vegetation management sites and 0.7 acres on access roads) of suitable WYBC habitat. WYBC require large blocks of riparian habitat for breeding. Home ranges are large, vary in size depending on seasonal food abundance, and overlap greatly both between members of a pair and between neighboring pairs. Individual home ranges during the breeding season average over 100 acres, and home ranges up to 697 acres have been recorded (Laymon and Halterman 1987, pp. 31–32; Halterman 2009, p. 93; Sechrist et al. 2009, p. 55; McNeil et al. 2010, p. 75; McNeil et al. 2011, p. 37; McNeil et al. 2012, p. 69; McNeil et al. 2013a, pp. 133–134; McNeil et al. 2013b, pp. 49–52). In a study on the Rio Grande in New Mexico, Sechrist et al. (2009, p. 55)

estimated a large variation in home range size, ranging from 12 to 697 acres, and averaging 202 acres using the Minimum Convex Polygon method. In a study on the upper San Pedro River in Arizona, Halterman (2009, pp. 67, 93) also estimated a large variation in home range size, ranging from 2.5 to 556 acres, and averaging 126 acres using the Minimum Convex Polygon method.

At the landscape level, the amount of cottonwood–willow-dominated vegetation cover and the width of riparian habitat influences WYBC distribution and abundance (Gaines and Laymon 1984).

We consider the size and juxtoposition of vegetation management sites in evaluating the effects on remaining habitat and WYBC. The modified project has the potential to affect WYBCs using the 355 acres in the 8 vegetation management sites. The 355 acres of suitable habitat planned for removal ranges from 5 to 95.7 acres. One or more WYBC home ranges may overlap with each vegetation management site. Because WYBC home ranges change, vary in size, and often overlap, it is not possible to know how many WYBCs will be affected between the time habitat is removed and replaced. Many of those 355 acres are dominated by native trees and shrubs with tamarisk in the understory, a habitat known to be used by breeding WYBCs. The only areas where WYBC have been detected to date within the action area are those with mature cottonwoods and willows with a tamarisk/willow understory but the entire 355 acres are considered to be suitable WYBC habitat. The understory tamarisk is slated for removal, but the willows and cottonwoods will be retained. The removal of tamarisk in the understory will adversely affect the overall quality of the remaining habitat in the short term by reducing insect production, cover, and humidity and increasing temperature. Fewer WYBCs will likely occupy the suitable habitat in and adjacent to the vegetation management sites from R3 to R18. No WYBC nests were identified in or around the vegetation management sites surveyed in 2015 (Johnson and Calvo 2015) , but it is possible that WYBC nests may be found in future years Reduced reproductive output is likely to result from fewer WYBCs breeding or from WYBCs attempting to breed in degraded habitat. Predation on nesting WYBC may increase with reduced cover. As a conservation measure and prior to initiation of tamarisk removal, protocol surveys will be conducted for WYBC by a qualified and permitted biologist on an annual basis to assess project effects prior to tamarisk removal. Data collected during these surveys will be used to establish buffers around any nest locations.

WYBC home ranges, averaging 200 acres, are more likely to be adversely affected by larger sites or aggregates of sites than smaller sites. One vegetation management site, R9, is 95.7 acres of suitable habitat. Four of the vegetation management sites, R3/R4 and R14/15 are adjacent to or close to one another, making their combined acreage a potentially greater impact on individual cuckoos than those sites farther away from one another or smaller in size. Sites R3 and R4, totalling 88.8 combined acres of suitable habitat, are close enough to each other to be within a home range of one or more WYBCs. Likewise, sites R14 and R15, totaling 100.2 acres of combined suitable habitat, are adjacent to one another and may also be within a home range of one or more WYBCs.

An unintended consequence of removal of tamarisk within the vegetation management sites may be a decline in health or mortality of the remaining native habitat that is no longer

protected by surrounding foliar cover and soil-binding roots. Sudden exposure to wind, erosion, and more extreme temperature can result in windthrow and dessication.

The impacts on WYBC using habitat adjacent to vegetation management sites depends on the size and juxtaposition to the habitat removed. The size of R9 and combined R3/R4 and R14/15 are large enough to impact habitat outside the treatment areas. However, even smaller and more linear sites that are directly across the river from what appear to be suitable habitat, such as R11 (28.7 total acres, 5 acres of suitable habitat) also adversely affect habitat outside the vegetation management sites. In both large sites and smaller linear sites, the removal of tamarisk within these sites likely results in reduced cover and humidity and increased temperature and predation along the exposed edges of the adjacent untreated habitat. In addition, once habitat is removed, the remaining suitable habitat outside the habitat management treatment area may be rendered too small or too narrow to continue to support a WYBC home range. In all these cases, WYBCs are harmed in the form of displacement or poor reproductive output.

Although treatment areas that are less dense or patchy with a mix of shrubs, ground cover, and tamarisk may not be used for nesting, they may be used for foraging and removal will reduce the prey availability in at least the short term.

Based on WYBC breeding habitat suitability modeling (see Section 4.4 of BA Addendum), tamarisk removal at the modified vegetation management sites may temporarily affect no more than 9 percent of the total suitable WYBC habitat in the action area. As such, while tamarisk removal and revegetation is occurring and developing at the modified vegetation management sites, there will still be an abundance of suitable habitat (the equivalent of 18 to 39 home ranges) in the action area for WYBC use.

Lastly, the proposed conservation measures are anticipated to be effective in virtually eliminating the potential for direct adverse effects of the proposed action, most notably scheduling noisy or ground-disturbing vegetation removal activities between October 1 to April 14 while WYBC are on their wintering grounds. Therefore, no direct impacts to WYBC, their nesting attempts, eggs, or young are expected to occur.

The PCEs of proposed WYBC critical habitat defined as described in the status of the species section are those habitat elements that provide sufficient riparian habitat for breeding, non-breeding, territorial, dispersing and migrating WYBC and to WYBC throughout their range, and provide those habitat components essential for conservation of the subspecies. Short-term effects on PCEs are expected during the habitat vegetation management process, between the time of removal of tamarisk and the growth of sufficient structure of native vegetation. Decreased cover due to clearing of tamarisk may increase rates of nest predation, reducing the suitability of nesting habitat. Creating gaps in vegetation may increase temperatures and lower relative humidity in the habitat patches, reducing the productivity of insects and therefore the suitability of foraging habitat. Overall, however, the project is expected (and explicitly designed) to improve native habitat along the Gila River, and because tamarisk removal is a focus, an additional net gain of suitable WYBC habitat could be expected**.**

CUMULATIVE EFFECTS

Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

The current land use in the action area consists of privately owned residences and agricultural lands. Agricultural production is primarily irrigated cotton and grazing for livestock. Agricultural fields are irrigated primarily using water diverted from the river at six hardened (permanent) and earthen (seasonal push-up) dams, with supplemental water pumped from shallow alluvial aquifers.

Table 9 summarizes the ongoing and future actions that are reasonably certain to occur in the project vicinity that could result in cumulative effects on the species analyzed in this biological opinion, alone or in combination with the proposed action.

Table 7. Potentially cumulative actions in the project vicinity.

Action	Location	Description	Status	Summary of potential effects
SRP's and Reclmation's Fort Thomas Preserve	Gila River near Fort Thomas (between R11 and R14)	Conservation and annual monitoring of riparian vegetation (1,259 acres) as off-site mitigation for SRP's water supply management activities (SRP 2013)	Ongoing, to be continued indefinitely	Beneficial effects on native riparian vegetation and riparian- obligate species habitat
FMI's Safford Valley Environmental Vegetation management Sites	Gila River between Solomon and Fort Thomas	Fallowing of agricultural lands and conservation, vegetation management, and monitoring of riparian vegetation on the Gila River as mitigation for Safford Mine water use impacts	Ongoing, to be continued indefinitely	Beneficial effects on native riparian vegetation and riparian- obligate species habitat
FMI's Safford Mine	Mountains north of Gila River valley, approximately 10 miles north of Safford	Construction and operation of open-pit copper mine, with plans to expand operations	Ongoing, with preliminary plans for expansion	Expansion may require additional water supply, thereby potentially reducing baseflows in the project vicinity

Gila Basin Irrigation Commission and Storage Project, Southwest New Mexico Regional Water Supply Plan, and Hidalgo County Off-Stream Project	Upper Gila River near Cliff, Silver City, and Virden in Grant and Hildago Counties, NM, approximately 70 miles upstream of Pima, AZ	Development of three new surface-water diversion projects along the upper Gila River in New Mexico (BOR 2014)	Construction pending state and federal approvals expected this year	Diversion of surface water from the upper Gila River in New Mexico, thereby potentially reducing baseflows in the project vicinity
Future Upper Gila Restoration	Duncan Valley and additional sites in Safford Valley	Tamarisk removal and revegetation of native riparian plants	Ongoing, with expansion planned as additional landowner permission and funding are acquired	Short-term effects on SWFL, WYBC, and critical habitat, but long-term improvement in quality

CONCLUSION

Southwestern Willow Flycatcher

After reviewing the current status of the SWFL, the environmental baseline for the action area, and the effects of the proposed vegetation management activities in the action area, it is our biological opinion that the action, as proposed, is neither likely to jeopardize the continued existence of the SWFL, nor likely to destroy or adversely modify critical habitat for the species. Our conclusion is based on the assumption that the proposed action is successful in growing and maintaining suitable native woodland habitat superior to existing habitat within five years of implementation. We also assume from the proposed action that cottonwood and willow trees that remain after adjacent tamarisk is removed will not decline in health or die from exposure. If monitoring shows that these assumptions are incorrect, reinitiation of consultation is required. We present these conclusions for the following reasons:

- SWFLs are known to breed within riparian vegetation along the Gila River upstream and downstream of the proposed management sites in large numbers, preventing the temporary impacts from this project from causing any population level impacts. For example, near Fort Thomas downstream of the action area over 100 territories were known to occur (SRP 2013). Similarly, in the Cliff-Gila Valley in western New Mexico territory numbers have ranged widely from near 100 to near 200 territories (USFWS 2002). Both areas have established long-term conservation associated specific to the SWFL. As a result of the abundant numbers of SWFL territories along the upper Gila River, the short-term temporary loss of territories from altering 291.9 acres is not expected to affect the persistence of SWFL along the entire upper Gila River. In the more immediate short-term, the project is intended to provide greater stability from the arrival of the leaf beetle until the next large flood event.

- The proposed action will result in temporary alteration of 291.9 acres of currently suitable nesting and foraging habitat and 410.09 acres of SWFL migration, foraging,

and dispersal habitat, through vegetation clearing and grading. This habitat will be managed through revegetation techniques and is intended to be functional for nesting SWFL within five years.

- Implementation of the conservation measures (see "Conservation Measures" section above) will eliminate direct impacts and minimize some of the negative indirect impacts to nesting SWFL. However, breeding SWFL are still expected to experience temporary displacement, reduced productivity, and increased predation/parasitism from the proposed project, though quantifying these effects would be difficult.

- We anticipate the temporary effects to PCEs 1 (riparian vegetation) and 2 (insect prey populations) on up to 410.09 acres within a 24.4-stream mile reach of critical habitat to be minor compared to overall amount of critical habitat designated within the Upper Gila Management Unit. The actual number of stream miles directly affected by this project is approximately 5.1 (or about 11 percent) of the 47.5 mile designated stream length of the Gila River in the Upper Gila Management Unit and 0.2 percent of the 208,973 acres of critical habitat rangewide.

Thus, while there is a measurable impact to SWFL critical habitat, the overall effect, considering the status of the SWFL and amount of acreage in the Management Unit, does not raise to a level of significance to substantially impact the function of critical habitat and the ability of the Management Unit to reach its recovery goals. Additionally, the goals of the project are for all targeted habitat to be better protected from the impacts of leaf beetles once more native vegetation is established within approximately five years. Also, because this section of the Gial River is prone to periodic devastating floods that remove large amounts of riparian vegetation, the overall impact of the project will likely be temporary in nature.

Western Yellow-billed cuckoo

After reviewing the current status of the WYBC, the environmental baseline for the action area, and the effects of the proposed vegetation management activities in the action area, it is our biological opinion that the action, as proposed, is neither likely to jeopardize the continued existence of the WYBC, nor likely to destroy or adversely modify proposed critical habitat for the species. Our conclusion is based on the assumption that the proposed action is successful in growing and maintaining suitable native woodland habitat superior to existing habitat within five years of implementation. We also assume from the proposed action that cottonwood and willow trees that remain after adjacent tamarisk is removed will not decline in health or die from exposure. If monitoring shows that these assumptions are incorrect, reinitiation of consultation is required. We present these conclusions for the following reasons:

- WYBCs are known to breed within riparian vegetation along the Gila River, upstream and downstream of the proposed management sites, and were detected within the project area during SWFL surveys. Twenty-six WYBC detections were documented within the action area in 2015. Impacts from this project are temporary and are not expected to cause any population level impacts. The proposed project is not expected to affect the persistence of WYBCs along the upper Gila River because loss of territories from a maximum of 355 acres is temporary, WYBC are present upstream and

downstream on the Gila River, and no specific treatment site is larger than the average home range size for WYBC. In the more immediate long-term, the project is expected to provide greater stability from the arrival of the leaf beetle until the next large flood event.

- The proposed action will result in temporary loss of up to 355 acres of WYBC habitat, through vegetation clearing and grading but, this habitat is expected to be restored through revegetation techniques and should be functional foraging habitat within five years and potential nesting habitat in the longer term.

- Implementation of the conservation measures (see "Conservation Measures" section above) would greatly minimize negative impacts to WYBCs and their habitat.

- We anticipate short-term effects to proposed PCEs 1, and 2 on up to 355 acres, or approximately 1.7 percent, of the 20,726 acres of riparian habitat along the Gila River in the Gila River proposed Critical Habitat Unit 36 and 0.065 percent of the 546,335 acres of proposed critical habitat rangewide. Thus, while there is a measurable impact, the overall effect, considering the status of the WYBC and amount of acreage in the proposed critical habitat unit, does not approach a level of significance to impact the function of proposed critical habitat. Additionally, the effects will be temporary in nature and within five years it is anticipated that a native riparian community will be established within the affected acres.

The conclusions of this biological opinion are based on full implementation of the project as described in the "Description of the Proposed Action" section of this document, including all 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 USACE so that they become binding conditions of any grant or permit issued to the GWP, as appropriate,

for the exemption in section 7(o)(2) to apply. The USACE has a continuing duty to regulate the activity covered by this incidental take statement. If the USACE (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 USACE 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

Amount or Extent of Take – Southwestern Willow Flycatcher

The USFWS anticipates incidental take of SWFL as a result of this proposed action. Although SWFL are migratory and spend only part of the year nesting in the action area, the area is still considered occupied because of their high site fidelity that causes them to return to the same areas to nest (USFWS 2002). Breeding SWFL have been detected at the vegetation management sites and have been utilizing the vegetation planned for renovation.

It is difficult to determine to with any accuracy exactly how many flycatcher territories may be affected by the proposed action. Vegetation patch size and shape that SWFLs use for nesting can vary from 0.25 ac to 175 ac (USFWS 2002). Mean reported size of breeding patches was 21.2 ac (USFWS 2002). Mean patch size of breeding sites supporting 10 or more SWFL territories was 62.2 ac (USFWS 2002). Based upon the number of SWFL territories reported in each patch, it required an average 2.7 ac for each territory in a patch (USFWS 2002). To clarify, these are generalizations across the subspecies range, and because breeding patches include areas that are not actively defended as territories, these numbers do not equate to average territory size (USFWS 2002). Additionally, SWFL habitat modeling identified an 11 acre "neighborhood" of vegetation surrounding territories as important toward creating conditions to attract nesting SWFL (USFWS 2002, SRP 2002). Within this action area, simple arithmetic concluded that 95 territories within 291.9 acres is about 3.1 acres per territory. This would suggest that possibly about 130 territories could be affected overall, should all 400 acres within the action area become occupied. However, we provide this only as an estimate to express a reflection of the neighborhood of what could occur.

These variations in the size of breeding patches used by SWFL and the number of nesting SWFL within a patch of habitat makes it nearly impossible to accurately predict how many pairs of SWFL will be nesting at these locations. The dynamic aspect of habitat conditions and annual fluctuations in breeding bird numbers causes additional challenges. As a result, we cannot quantify exactly how many breeding SWFL will be taken at the project location and therefore will use habitat as a surrogate.

The SWFL habitat within these management areas is expected to be removed/altered at eight management areas, but vegetation is also expected to persist from buffered conservation measures and be re-established by replanting. The specific location of habitat alteration activities throughout the project and pace of the project is unknown. As a result, it is anticipated

the SWFL and their breeding habitat will be affected (reduced territories and productivity, increased predation) by the project until planted habitat is re-established in suitable condition. We expect that, barring a natural disturbance event, like a flood, it will take up to five years for habitat to be re-established in suitable condition.

Therefore, due to the removal and alteration of SWFL nesting habitat and erratic pace of implementing the project, we anticipate that the project will result in harm or harassment of all breeding SWFLs in the 410.09 acre project area. Removal, alteration, and fragmentation of SWFL nesting habitat within management sites will harm and harass SWFLs by forcing SWFLs to relocate to areas of unknown status and condition, likely either preventing reproduction or resulting in reduced productivity. SWFLs attempting to nest at affected management sites are expected to be harmed by reduced productivity from altered nesting habitat and/or increased levels of predation and brood parasitism.

Incidental take will be considered to have been exceeded if after 5 years, replanted riparian vegetation has not been successfully reestablished within the project site. Successfully reestablished riparian vegetation will be considered dense vegetation with average heights of 9 to 19 ft (USFWS 2002). In order to assess the quality (density and abundance) of vegetation within the management sites, incidental take will be considered to have been exceeded if an evaluation of the treated areas at the end of five years by the SWFL habitat suitability model (Hatten and Paradzick 2003) that does not reach a level 4 or 5 (60-100% likely to have nesting SWFLs). Pursuant to 50 CFR 402.16, reinitiation of consultation would be required to the extent ACOE retains discretion over the proposed action.

Amount or Extent of Take – Western Yellow-billed Cuckoo

We anticipate that the proposed action will result in incidental take of WYBCs in the form of harm through temporary loss of suitable and occupied habitat from removal of tamarisk. Although WYBC are migratory and spend only part of the year in the action area, the area is still considered occupied because WYBCs are detected throughout the action area and on nearby properties during the breeding season (Johnson and Calvo 2015). Because WYBCs have large home ranges averaging greater than 100 acres (Laymon and Halterman 1987, pp. 31–32; Halterman 2009, p. 93; Sechrist et al. 2009, p. 55; McNeil et al. 2010, p. 75; McNeil et al. 2011, p. 37; McNeil et al. 2012, p. 69; McNeil et al. 2013a, pp. 133–134; McNeil et al. 2013b, pp. 49–52) and are known to be present in the action area and are known to be breeding on nearby properties, the 8 vegetation treatment areas may be within home ranges of nesting WYBCs. The vegetation management sites contribute to the overall home range used by WYBCs by contributing toward insect production, temperature amelioration, and hiding cover. WYBCs were found in five of six treatment areas surveyed in 2015; the two remaining treatment areas were not surveyed. The existing tamarisk in the vegetation management sites contributes toward suitable WYBC habitat by producing insects and providing temperature amelioration and cover.

We recognize that providing a numerical estimate of incidental take is the preferred method of measuring take. However, we must use habitat as a surrogate for the amount or extent of take because the number of WYBCs in a given area cannot be determined with existing information

and techniques. Counting WYBCs is difficult because males and females look and sound alike, they have large overlapping home ranges, they are behaviorally secretive, they have short breeding cycles, and they can move to different locations within and between breeding seasons (Halterman *et al*. 2016). These factors can lead to either underestimating or overestimating the number of WYBCs. Protocol surveys (Halterman *et al*. 2016) are designed only to determine presence/absence in a given reach rather than an accurate count of individual birds. Additional surveys and methods, including banding and possibly monitoring telemetered birds, would need to be employed to obtain an accurate count of individual birds and pairs throughout the breeding season.

It is reasonable to assume that the abundance of WYBCs is correlated with the extent of suitable riparian habitat. We therefore quantified the adverse effects of the proposed action as the number of acres of habitat that we anticipate will be degraded due to tamarisk removal. We anticipate that 355 acress of suitable habitat will be removed at eight sites, primarily tamarisk understory inbetween cottonwood and willow trees.

The WYBC habitat within these management areas is expected to be removed or altered, but vegetation is also expected to be re-established by replanting. As a result, it is anticipated the WYBC and its breeding habitat will be affected (reduced territories and productivity, increased predation) by the project until planted habitat is re-established in suitable condition. We expect that, barring a natural disturbance event, like a flood, it will take up to five years for habitat to be re-established in suitable condition.

Therefore, due to the temporary removal and alteration of WYBC nesting habitat we anticipate that the project will result in harm or harassment of all WYBCs in the 355 acre project area in year one and two, and continue to harm some or all WYBCs in years three through five in all affected acres. Removal of WYBC habitat within management sites will harm and harass WYBC by reducing the quality and amount of suitable habitat, likely resulting in reduced productivity. WYBCs attempting to nest within or near affected management sites are expected to be harmed by reduced productivity from altered suitable habitat within their home range(s) and/or increased levels of predation.

Incidental take will be considered to have been exceeded if after five years, replanted riparian vegetation has not been successfully reestablished within the project site and is not of at least the same quality as the habitat it replaced. Incidental take will be considered to have been exceeded if an evaluation of the management areas at the end of five years by the WYBC habitat suitability model (Hatten, unpubl.) does not reach suitability ratings of 3, 4, or 5 (Table 8). Alternatively, we may use the same success standards for SWFL as for WYBC to simplify field measurements and analyses. Pursuant to 50 CFR 402.16, reinitiation of consultation would be required to the extent ACOE retains discretion over the proposed action.

EFFECT OF THE TAKE

In this biological opinion, the USFWS determines 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 AND TERMS AND CONDITIONS

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

Southwestern willow flycatcher
The following reasonable and prudent measure and terms and conditions are necessary and appropriate to minimize take of SWFL:

Monitor the effects of the proposed action and report the findings to this office.

1.1 The USACE shall ensure that the permittee monitors the riparian plantings in accordance with the approved contract for the grant.

A. The USACE shall ensure the project area and other areas that could be affected by the proposed action is monitored to ascertain take of individuals of the species or loss of its habitat that causes harm or harassment to the species.

B. The USACE shall submit annual monitoring reports to the Arizona Ecological Services Field Office by December 31st beginning in year 2015. These reports shall briefly document for the previous calendar year the effectiveness of the terms and conditions and locations of listed species observed, and, if any are found dead, suspected cause of mortality. The reports shall also summarize tasks accomplished under the proposed minimization measures and terms and conditions. The reports shall make recommendations for modifying or refining these terms and conditions to enhance listed species protection or reduce needless hardship on the USACE and its permittees.

Western yellow-billed cuckoo
The following reasonable and prudent measure and terms and conditions are necessary and appropriate to minimize take of WYBC:

Monitor the effects of the proposed action and report the findings to this office.

1.1. The USACE shall ensure that the permittee monitors the riparian plantings in accordance with the approved contract for the grant and conducts WYBC surveys.

A. The USACE shall ensure the project area and other areas that could be affected by the proposed action are monitored to ascertain take of individuals of the species or loss of its habitat that causes harm or harassment to the species.

B. A qualified biologist shall conduct annual WYBCU protocol surveys (Halterman et al. 2016) and nest searches within the action area, including the eight vegetation management sites.

C. In the event a WYBC nest is found, tamarisk removal shall not occur within a minimum of 200 ft of an active nest.

D. The USACE shall submit annual monitoring reports to the Arizona Ecological Services Field Office by December 31st beginning in year 2016. These reports shall briefly document for the previous calendar year the effectiveness of the terms and conditions and locations of listed species observed, and, if any are found dead, suspected cause of mortality. The reports shall also summarize tasks accomplished under the proposed minimization measures and terms and conditions. The reports shall make recommendations for modifying or refining these terms and conditions to enhance listed species protection or reduce needless hardship on the USACE and its permittees.

Review requirement: 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 Corps must immediately provide an explanation of the causes of the taking and review with the AESO the need for possible modification of the reasonable and prudent measures.

CONSERVATION RECOMMENDATIONS

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

Southwestern willow flycatcher

1. We recommend the GWP continue to work with its partners along the Gila River and implement strategies described in the Flycatcher Recovery Plan. Specifically, we recommend the development and implementation of management plans that reduce threats and address the physical elements and processes of rivers in order to improve the distribution, abundance, and persistence of riparian habitat. Management plans should focus on removing threats more than engineering elaborate cures, mitigation, or contrived vegetation management. Where feasible and effective, conserve and restore natural processes and elements by removing stressors or, secondarily, modifying the stressors for natural recovery. Reestablish physical integrity of rivers, then proceed to biological integrity of SWFL habitat. Physical integrity for rivers implies vegetation management and maintenance of their primary functions of water and sediment dynamics. The vegetation communities needed for SWFL habitat require specific hydrologic and geomorphic conditions, primarily floods, elevated groundwater levels, sediments, and persistent water.

2. To improve our assessment of the project's influence on SWFL nest site selection, distribution, abundance, and reproductive output we recommend conducting nest searches and nest monitoring.
3. Research the additional monitoring parameters identified in the proposed action that would only be addressed if funding permitted including:
    a. What are the existing (pre-beetle) SWFL and WYBC population distributions and abundances, and how will these respond to the proposed vegetation management efforts before and following beetle colonization?
    b. What patterns of tamarisk defoliation and mortality emerge following beetle colonization?
    c. How are other environmental factors (e.g., groundwater levels, soil properties, water quality, and natural recruitment of native plants) responding to initial vegetation management efforts and again following beetle colonization?
4. We encourage the GWP to continue to communicate with its members, landowners and others about the latest science behind the persistence of tamarisk and various incorrect perceptions about its impacts to wildlife, water consumption, and soil salinity. We recommend USGS's Saltcedar and Russian Olive Control Demonstration Act Science Assessment (Shafroth et al. 2010); Stromberg's article in Restoration Ecology titled "Changing Perceptions of Change: The Role of Scientists in Tamarix and River Management."

Yellow-billed cuckoo

1. We recommend the GWP continue to work with local landowners to conserve and restore natural processes and elements in the Gila River Watershed by removing stressors or, secondarily, modify the stressors by naturalizing flow regimes, modifying grazing regimes, and/or removing barriers between channels and floodplains, to allow for natural recovery. Specifically, we recommend the development and implementation of management plans that reduce threats and address the physical elements and processes of rivers in order to improve the distribution and abundance of riparian habitat. Management plans should focus on removing threats rather than engineering elaborate cures, mitigation, or contrived vegetation management. The hydrologic and geomorphic river function should be reestablished first to allow for development and persistence of WYBC habitat. The vegetation communities needed for WYBC habitat in this area require specific hydrologic and geomorphic conditions: primarily floods, elevated groundwater levels, sediments, and persistent water.
2. We recommend the GWP research the additional monitoring parameters identified in the proposed action that would only be addressed if funding permitted including:
    a. What are the existing (pre-beetle) SWFL and WYBC population distributions and abundances, and how will these respond to the proposed vegetation management efforts before and following beetle colonization?
    b. What patterns of tamarisk defoliation and mortality emerge following beetle colonization?
    c. How are other environmental factors (e.g., groundwater levels, soil properties, water quality, and natural recruitment of native plants) responding to initial vegetation management efforts and again following beetle colonization?

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. Follow-up monitoring and reporting will be crucial in assessing a) the success and cost/effectiveness of this project in producing habitat superior to that which currently exists and b) whether or not these methods should be considered for future vegetation management projects.

Disposition of Dead or Injured Listed Species

Upon locating a dead, injured, or sick listed species initial notification must be made to the USFWS's Law Enforcement Office, 4901 Paseo del Norte NE, Suite D, Albuquerque, NM 87113; 505-248-7889) within three working days of its finding. Written notification must be made within five calendar days and include the date, time, and location of the animal, a photograph if possible, and any other pertinent information. The notification shall be sent to the Law Enforcement Office with a copy to this office. Care must be taken in handling sick or injured animals to ensure effective treatment and care and in handling dead specimens to preserve the biological material in the best possible state.

Certain project activities may also affect species that are protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. sec. 703-712) and/or bald and golden eagles protected under the Bald and Golden Eagle Protection Act (BGEPA). The Migratory Bird Treaty Act (MBTA) prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when specifically authorized by the USFWS. BGEPA prohibits anyone, without a permit issued by the USFWS, from taking (including disturbing) eagles, and including their parts, nests, or eggs. If you believe migratory birds will be affected by the project, we recommend you contact our Migratory Bird Permit Office, P.O. Box709, Albuquerque, NM 87103, (505) 248-7882, or permitsR2mb@fws.gov. For more information regarding the MBTA, please visit the following websites: http://www.fws.gov/migratorybirds and http://www.fws.gov/migratorybirds/mbpermits.html.

For information on protections for bald eagles under the BGEPA, please refer to the USFWS's National Bald Eagle Management Guidelines (72 FR 31156) and regulatory definition of the term "disturb" (72 FR 31132) that were published in the Federal Register on June 5, 2007. Existing take authorizations for bald eagles issued under the Act became covered under the BGEPA via a final rule published in the Federal Register on May 20, 2008 (73 FR 29075). Our office is also available to provide technical assistance to help you with compliance.

REINITIATION NOTICE

This concludes both the formal and conference opinion for the Upper Gila River Vegetation management Project as outlined by the US Army Corps of Engineers. You may ask the USFWS to confirm the conference opinion (yellow-billed cuckoo proposed critical habitat) as a biological opinion issued through formal consultation if the proposed species is listed or critical habitat is designated. The request must be in writing. If the USFWS reviews the proposed action and finds there have been no significant changes in the action as planned or in the information used

during the conference, the USFWS will confirm the conference opinion as the biological opinion for the project and no further section 7 consultation will be necessary.

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.

In Chapter 2, Figure 10, of the December 31, 2015 Project Progress and Monitoring Report, we noted that 8.54 acres were treated in 2015 that were outside of areas proposed in the original project design which was subsequently consulted upon. The reasons given for this deviation in project implementation include variability introduced by access route establishment, unexpected outside project participation, and GPS inaccuracy when flagging site boundaries. We understand projects of this nature have inherent issues that can lead to some variability in actual, on-the-ground implementation. While a change in project implementation can trigger consultation reinitiation criteria, we consider this specific deviation not to have caused an effect to the species that was not considered in this opinion.

In keeping with our trust responsibilities to American Indian Tribes, we encourage you to coordinate with the Bureau of Indian Affairs in the implementation of this consultation and, by copy of this biological opinion, are notifying affected Tribes of its completion (Hopi Tribe, San Carlos Apache Tribe, and White Mountain Apache Tribe). We also encourage you to coordinate the review of this project with the Arizona Game and Fish Department.

The USFWS appreciates the U.S. Army Corps of Engineers efforts to identify and minimize effects to listed species from this project. For further information please contact Jeff Servoss (520) 670-6150 (x231) or Jean Calhoun at x223. Please refer to the consultation number, 02EAAZZ00-2014-F-0151-R1, in future correspondence concerning this project.

Sincerely,

/s/ Steven L. Spangle
Field Supervisor

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Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ

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Appendix A: Map Views of Proposed Vegetation Management Sites

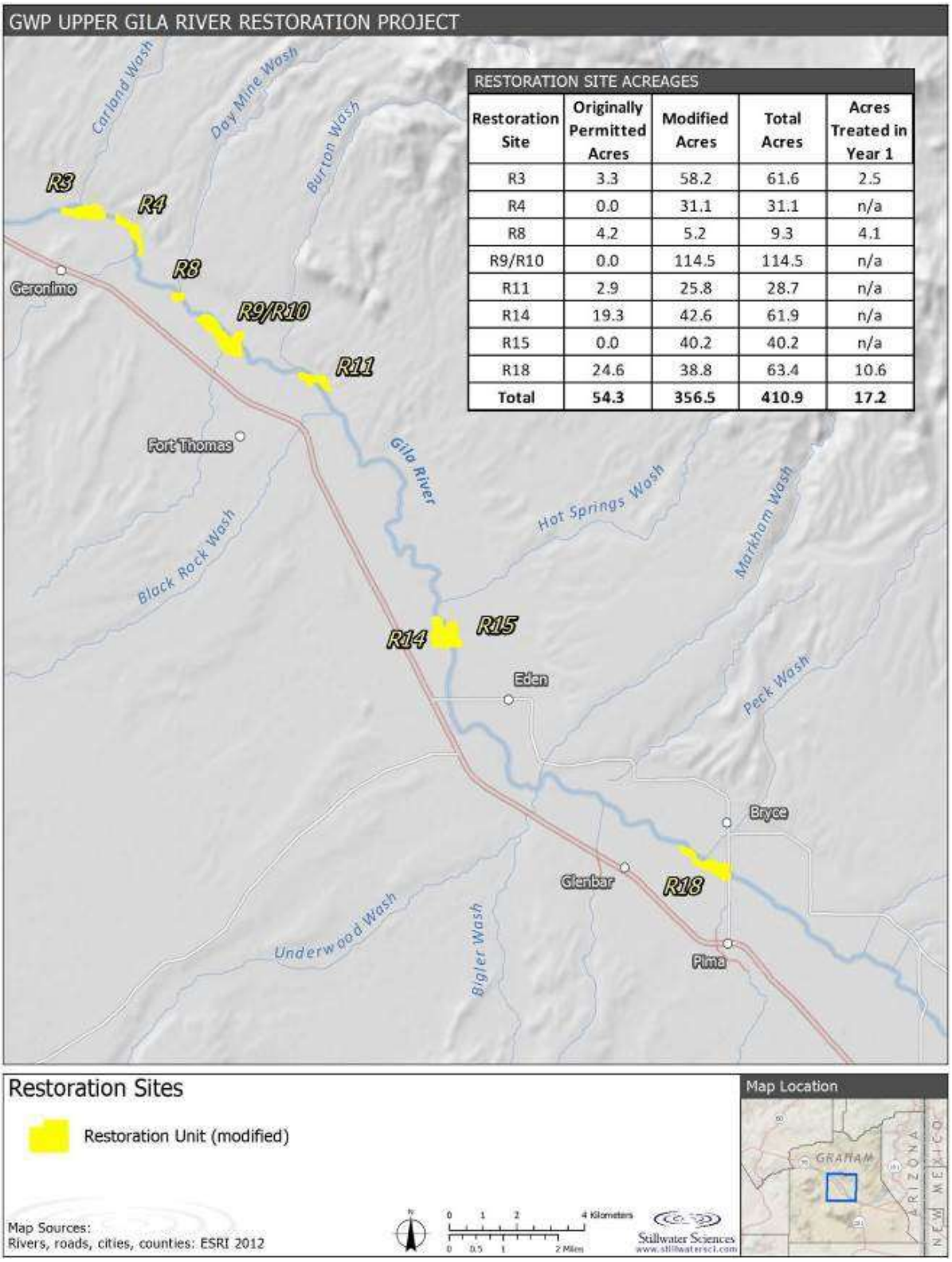

Figure A1. Vicinity map of the upper Gila River and project vegetation management sites.

Figure A2. Plan view map of restoration site R3.

Figure A3. Plan view map of vegetation management site R4.

Figure A4. Plan view map of vegetation management site R8.

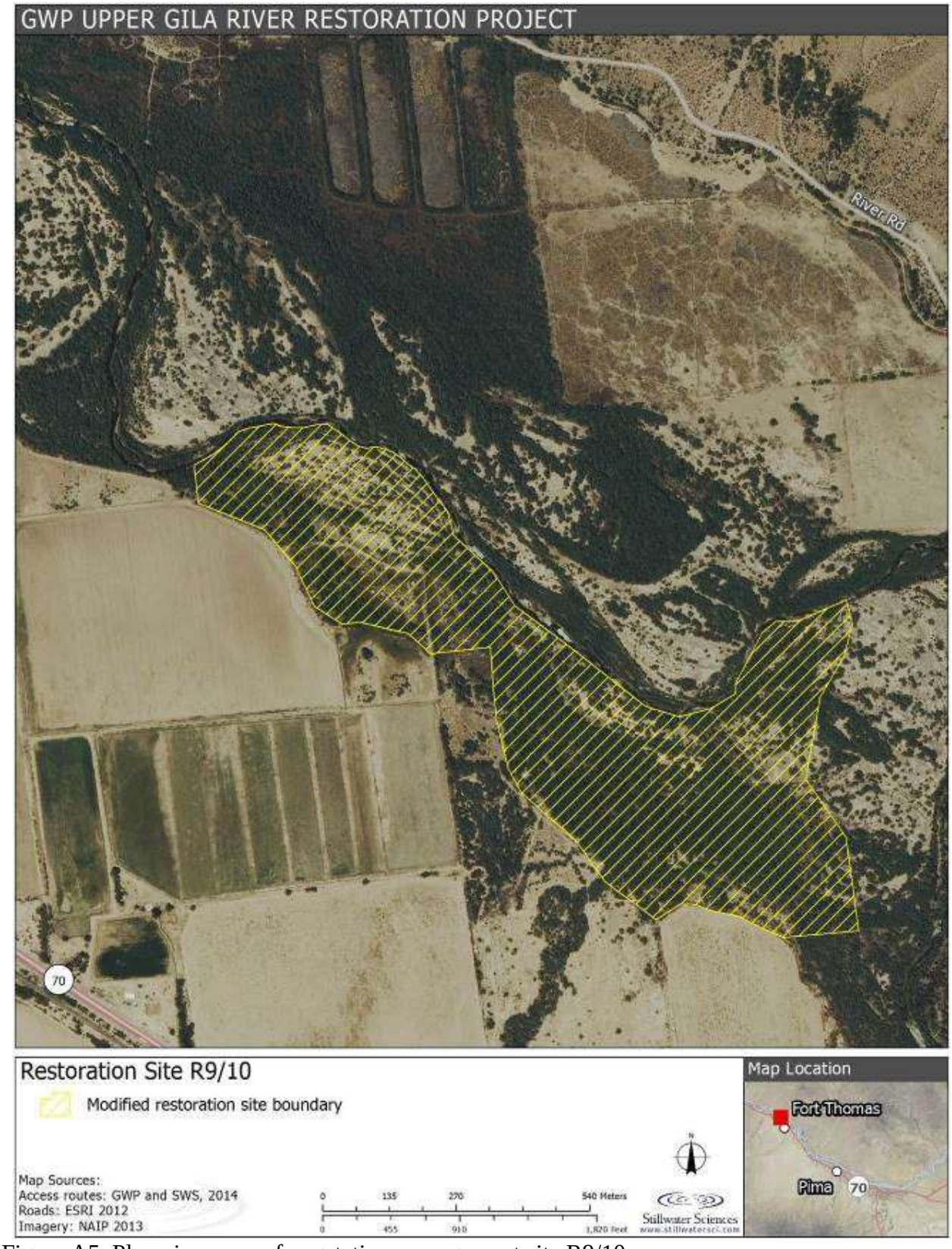

Figure A5. Plan view map of vegetation management site R9/10.

Figure A6. Plan view map of vegetation management site R11.

Figure A7. Plan view map of vegetation management site R14 and R15.

Figure A8. Plan view map of vegetation management site R18.