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Fish and Wildlife Service
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Phoenix, Arizona 85021-4951
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In Reply Refer To
AESO/SE

02EAAZZ00-2015-F-0151

February 6, 2015

Mr. Robert Dummer
Los Angeles District, Corps of Engineers
Arizona-Nevada Area Office
3636 North Central Avenue, Suite 760
Phoenix, Arizona 85021-1936

RE: Upper Gila River Vegetation Management Project

Dear Mr. Dummer:

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (ESA). Your request was dated November 28, 2014, and received by us on December 1, 2014. At issue are impacts that may result from 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*) and "may affect, but is not likely to adversely affect" it's critical habitat. We concur with your determination that the project may affect, but is not likely to adversely affect razorback sucker critical habitat. The basis for our concurrences is found in Appendix A.

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), telephone conversations, 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 non-native 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 it's 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.

BIOLOGICAL AND CONFERENCE OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed project includes 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, which run approximately parallel to U.S. Highway 70 (Hwy 70) (Figure 1). The five 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 five vegetation management sites (which retain the numbering system used in the ecohydrological assessment) are R3, R8, R11, R14, and R18, which range in size from 2.9 to 24.6 acres, and total approximately 54.4 acres. The vicinity of the project's vegetation management sites is mapped in Figure 1, and the individual vegetation management sites are mapped in Figures 2 through 6.

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 five project vegetation management sites. As such, the action area encompasses all five of the vegetation management sites, proposed (as yet undeveloped) 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.

The activities described below include those potentially subject to authorization by the USACE Section 404 permit as well as all interrelated and interdependent actions at the five vegetation management sites. These activities will occur over an estimated period of five years, beginning at the time of 404 permit acquisition, with the bulk of work likely to occur over the first three years.

While future phases of the project are anticipated, additional vegetation management sites have not yet been identified, funding has not yet been secured, and activities undertaken in future phases are not dependent upon those implemented in the current project. Additional acres of vegetation management that may be implemented in future phases will be analyzed in a separate consultation and are not analyzed in this biological opinion. This consultation is for vegetation management work that may occur in the next five years.

Vegetation Management Sites

Vegetation management sites are depicted in Figures 2 through 6, and the activities that would occur at each site are described generally in Table 1. Additional details of the proposed actions to be implemented at each vegetation management site are provided below.

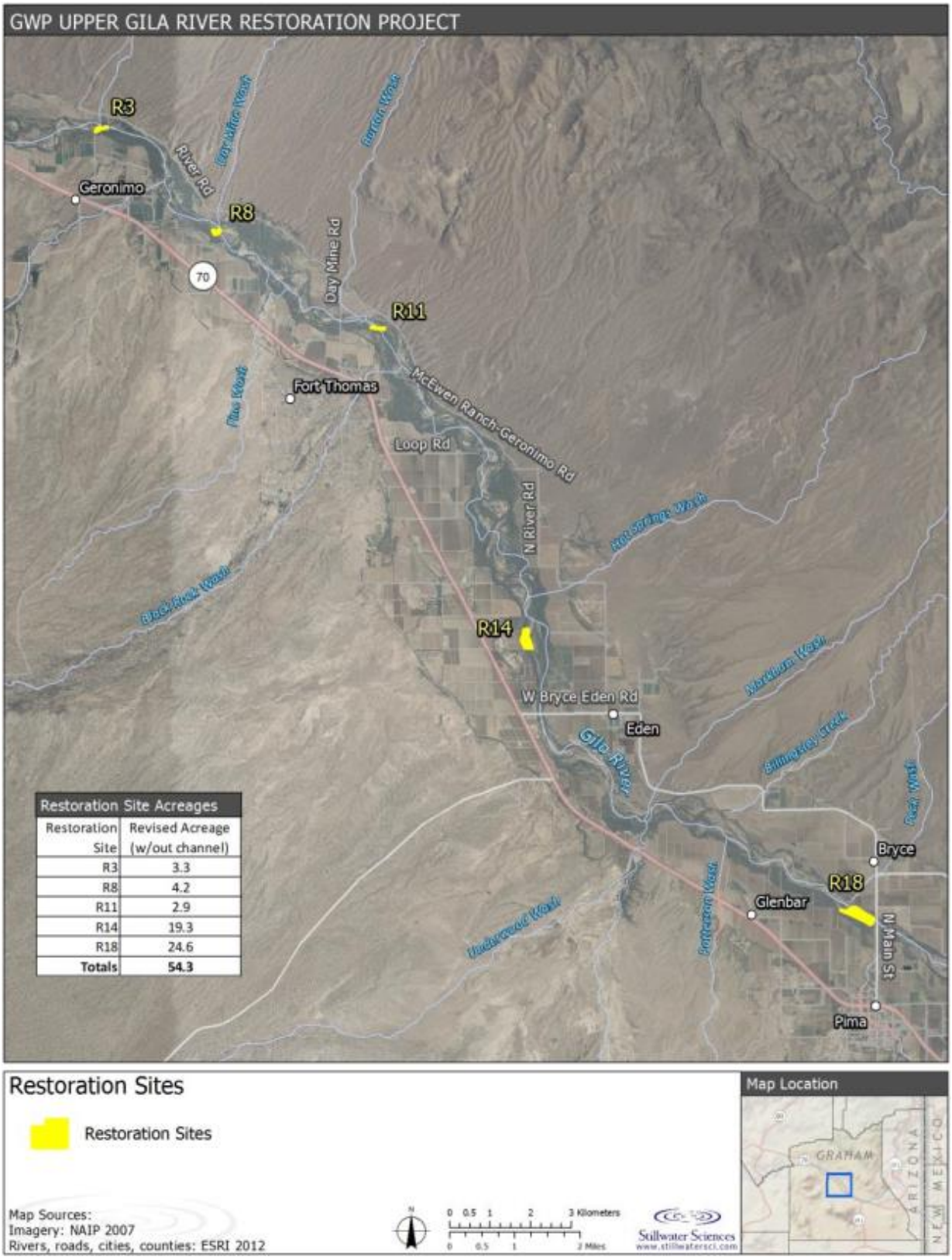

Figure 1. Vicinity of the project's vegetation management sites.

Table 1. Summary of vegetation management site activities and total site size.

Vegetation management site	Summary of activities	Site size (acres)[1]
R3	• Access route establishment, and post-project reclamation, from agricultural roads to the south • Willow and cottonwood cutting collection • Tamarisk removal and native plant revegetation • Monitoring and maintenance • Tamarisk resprout treatment and revegetation in any area affected by fire	3.3
R8	• Access route establishment, and post-project reclamation, from agricultural roads to the south • Willow and cottonwood cutting collection • Tamarisk removal and native plant revegetation • Excavation to establish shorter distances to groundwater • Monitoring and maintenance at treatment patches • Tamarisk resprout treatment and revegetation in any area affected by fire	4.2
R11	• Access route establishment, and post-project reclamation, from agricultural roads to the south • Willow and cottonwood cutting collection • Tamarisk removal and native plant revegetation on both the north and south banks of the river • Monitoring and maintenance on both the north and south banks of the river • Tamarisk resprout treatment and revegetation in any area affected by fire	2.9
R14	• Willow and cottonwood cutting collection • Tamarisk removal and native plant revegetation • Excavation to establish shorter distances to groundwater • Monitoring and maintenance • Tamarisk resprout treatment and revegetation in any area affected by fire • (This site is adjacent to agricultural roads, so no access routes will need to be established.)	19.3
R18	• Access route establishment, and post-project reclamation, from agricultural roads to the east • Willow and cottonwood cutting collection • Excavation to establish shorter distance to groundwater along south side of river • Take advantage of irrigation return flows on northern portion of site • Tamarisk removal and native plant revegetation on both the north and south banks of the river • Monitoring and maintenance on both the north and south banks of the river • Tamarisk resprout treatment and revegetation in any area affected by fire	24.6

[1]The size of vegetation management sites R11 and R18 does not include the Gila River channel in between the north and south banks of the river, where no vegetation management work would occur.

Figure 2. Vegetation management site R3.

Figure 3. Vegetation management site R8.

Figure 4. Vegetation management site R11.

Figure 5. Vegetation management site R14.

Figure 6. Vegetation management site R18.

Non-Native 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 anticipated 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 2. Summary of tamarisk removal methods.

Vegetation management site condition	Tamarisk removal methods
Current conditions	The vegetation management sites are located almost entirely within occupied or highly suitable SWFL habitat. Sites may also be used by WYBC. These areas are predicted to be impacted following beetle colonization. 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	Little to no tamarisk biomass removal would be necessary under this condition, as most of the pre-fire biomass would have been burned, but 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 five 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.

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.

Native grass seeds (of species such as alkali sacaton [*Sporobolus airoides*] and big sacaton [*S. wrightii*]) will be spread across the treatment area prior to mulching, to initiate native plant establishment and help prevent other nonnative species from establishing. The GWP is working witg Wildlands Restoration to build a seed mix that was collected from the Gila Valley. The mulched tamarisk material (i.e., wood chips) will be left on-site, and spread over the native grass seeds to help retain soil moisture for the germinating seeds 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 Pathfinder), 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 65-ft nest buffer will be installed around every known SWFL nest site. The buffer distance was developed by the GWP and 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 65 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 September 30–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.

In the first year after permit acquisition (2015), it is anticipated that tamarisk removal will be completed at vegetation management sites R3, R8, R11, and R14. In the second year (2016), it is anticipated that tamarisk removal will be completed at vegetation management site R18, and any necessary tamarisk re-sprout treatment will be conducted at the other vegetation management sites. In the third through fifth years, tamarisk re-sprout treatment would be conducted, as needed, at all of the vegetation management sites. This schedule represents the goals of GWP, but is preliminary and subject to change.

Over the five-year project term, work may occur within the established nest 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, 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 2014 surveys, no work would occur within the nest buffer in 2015. If that nest is again occupied in 2015, no work would occur in the nest buffer in 2016. If the nest is not occupied in 2015, then work could occur in and around the nest site in 2016.
- 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 buffer of occupied SWFL nests, 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 3 and are described in greater detail below.

Table 3. 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*), big sacaton (*S. wrightii*), spike-rush (*Eleocharis palustris*), and California bulrush (*Schoenoplectus californicus*).
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 deltoides, 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*), black elder (*Sambucus nigra*), 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. Mechanical planting of pole cuttings may entail the use of a hydrodrill tool (e.g., Waterjet Stinger) to expedite the planting process. All container stock will originate from the GWP's native plant nursery. Cutting collection is described below. 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.

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 vegetation management sites R8, R14, and the river-left (south) portion of site R18, 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.

At all vegetation management sites, minor streambank recontouring may be conducted concurrently with tamarisk removal to create more appropriate and/or safer conditions for revegetation activities. This may involve heavy equipment operation in the low-flow channel and adjacent streambanks of the Gila River. Recontouring areas would typically be less than 5 ft deep (as measured below the streambank/floodplain surface), 100 ft long (as measured parallel to the river), and 10 ft wide (as measured perpendicular to the river). All recontouring material would remain on-site and be spread out around the recontouring area to create natural-looking topography; no fill would be placed in the low-flow channel.

Earthwork would typically 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. Earthwork along the river would be conducted during appropriate dry days, and would not occur during rain events.

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, identified by aerial photography interpretation and 2014 field reconnaissance, are depicted in Figures 2-6 and tabulated in Table 4; 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 4,400 ft (0.8 mile, or 1.2 acres assuming a 12-ft-wide road) of existing access routes (i.e., existing undeveloped roads and trails) will be minimally cleared using hand tools such as pruning loppers and chainsaws. No more than 2,600 ft (0.5 mile, or 0.7 acres assuming a 12-ft-wide road) of new access routes (i.e., where there is no sign of existing roads or trails) will be cleared using hand tools and/or a small 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. As with tamarisk treatment areas, native grass seeds will be spread across new access routes prior to mulching. The mulched material (i.e., wood chips) will be left on-site, and spread over the native grass seeds to help retain soil moisture for the germinating seeds and to hinder recruitment of nonnative weeds. 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.

Table 4. Existing and new preliminary access route lengths.

Vegetation management site	Existing access routes (feet)	New access routes (feet)
R3	394	1,291
R8	0	987
R11	1,499	137
R14	1,231	0
R18	1,270	160
Total	4,394	2,575

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% 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.

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, starting in 2015.

A qualified/permitted biologist will also be conducting annual surveys for SWFL, incidental SWFL nests, and incidental WYBC occurrences at the restoration 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 pre-treatment seeding and 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; and vegetation management site visits and access on foot.
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), 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 goal of nest 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 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 65 ft of known SWFL nests within or adjacent to vegetation management site boundaries (see Figures 7 through 11). While nest buffers would be a minimum of 65 ft, as described and depicted in the project description, the use of site conditions around the nest to identify buffer areas will likely result in SWFL nest buffers that are greater than 65 ft in some areas and irregularly shaped, rather than circular. 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 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% 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. Native grass seeds (of species such as *S. airoides* and *S. wrightii*) local to the geographic area will be spread across the treatment area prior to mulching, to initiate native plant establishment and help prevent other nonnative species from establishing. The mulched tamarisk material (i.e., wood chips) will be left on-site, and spread over the native grass

seeds to help retain soil moisture for the germinating seeds 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.

STATUS OF THE SPECIES

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 flycatcher 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 flycatcher, 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 SWFLwas 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 flycatcher breeding habitat, especially coupled with habitat fragmentation, cowbird parasitism of flycatcher 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 flycatcher'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 flycatcher'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). Flycatcher 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 flycatcher's nesting and foraging habitat in the central part of the flycatcher's breeding range in Arizona, southern Nevada and Utah, and western New Mexico. In 2001 in Arizona, 323 of the 404 (80 percent) known flycatcher 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 flycatchers 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 flycatcher. Along this Virgin River site in 2009, 13 of 15 flycatcher 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 flycatcher'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 flycatcher territories (Durst *et al.* 2008), continued spread of the beetle has the potential to significantly alter the distribution, abundance, and quality of flycatcher 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). Flycatchers 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 flycatcher 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 flycatchers.

Cardinal and Paxton (2005) found that the home ranges of telemetered flycatchers 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 flycatchers 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, flycatchers 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 5. 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 flycatcher has been detected) holding an estimated 1,299 territories (Durst *et al.* 2008). It is difficult to arrive at a

grand total of flycatcher 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 flycatchers 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 flycatcher.

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 flycatcher 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 flycatchers (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 flycatcher critical habitat are the principal biological or physical elements essential to flycatcher conservation which may require special management considerations or protection (USFWS 2013a). We primarily identified the features and functions of rivers that generate flycatcher 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 227 Federal agency actions have undergone (or are currently under) formal section 7 consultation throughout the flycatcher's range. This list of consultation can be found in the administrative record for this consultation. Since flycatcher 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 flycatcher habitat throughout its range (development, urbanization, grazing, recreation, native and non-native habitat removal, dam operations, river crossings, ground and surface water extraction, etc.). Introduced tamarisk-eating leaf beetles were not anticipated to persist within the range of the SWFL. However, they were detected within the breeding habitat (and designated critical habitat) of the flycatcher 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 flycatcher 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 flycatcher habitat.

Conservation measures associated with some consultations and Habitat Conservation Plans have helped to acquire lands specifically for flycatchers on the San Pedro, Verde, and Gila rivers in Arizona and the Kern River in California. 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 flycatchers. A variety of Tribal Management Plans in California, Arizoan, and New Mexico have been established to guide conservation of the flycatchers. Additionally, during the development of the critical habitat rule, management plans were developed for some private lands along the Owens River in California and Gila River in New Mexico. 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 five 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. We believe the action area is larger than the footprint of each vegetation management sites at the following areas:

R3 – The northern edge of this site is the Gila River and the southern edge is drier. Effects from the project could extend upstream and downstream of the vegetation management site boundary.

R8 – Effects from the proposed project at this site may occur at the northern edge of the property that is closest to the Gila River.

R11 – This vegetation management site is bisected by the Gila River. It is anticipated that effects from the project could extend upstream and downstream of the vegetation management site boundary.

R14 – This vegetation management site eastern boundary is the Gila River and the western boundary is an agricultural field. Edge effects could occur upstream and downstream from the project site.

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.

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 at the vegetation management sites and surrounding area in 2014 by Matt Johnson and Calvo (unpubl. data). Figures 7-11 show SWFL detections. The surveys covered an area larger than each vegetation management site. Thirteen SWFL territories and seven nests, one with a confirmed breeding success (one fledgling), were located at or near vegetation management site R3; 11 SWFL territories and two nests, one with confirmed breeding success (two fledglings), were located at or near R8; four territories and one nest with confirmed breeding success (one fledgling) were located at or near R11; seven territories and two nests, one with a confirmed breeding success (1 fledgling), were located at or near R14; and four territories and two nests, one with confirmed breeding success (one fledgling), were located at or near R18 (another nest had three nestlings but the breeding outcome is unknown). Tables 6 and 7 summarize the Johnson and Calvo (unpubl. data) 2014 SFWL detections and nests.

Table 6. Number of SFWL detections at or near vegetation management sites during 2014 surveys.

Vegetation management site	**Survey period**					**Total detections per site**
	1	**2**	**3**	**4**	**5**	
R3	14	23	21	21	24	103
R8	16	14	14	10	9	63
R11	5	5	6	3	5	24
R14	4	10	12	8	4	38
R18	3	6	8	3	6	26
Total detections per period	42	58	61	45	48	254

Source: Johnson and Calvo, unpubl. data.

Table 7. Number of SFWL nests detected at or near vegetation management sites during 2014 surveys. Nest surveys were not performed, but nests were detected during SFWL surveys. Additional nests may occur within the action area.

Vegetation management site	Number of Territories	Number of nests
R3	13	7
R8	11	2
R11	4	1
R14	7	2
R18	4	2
Total nests	39	14

Table 6 and 7 show survey results for the property which extend beyond the 54.4 acres proposed for vegetation management. Figures 7 – 11 show the approximate treatment area and surveys results for the SWFL.

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 five 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).

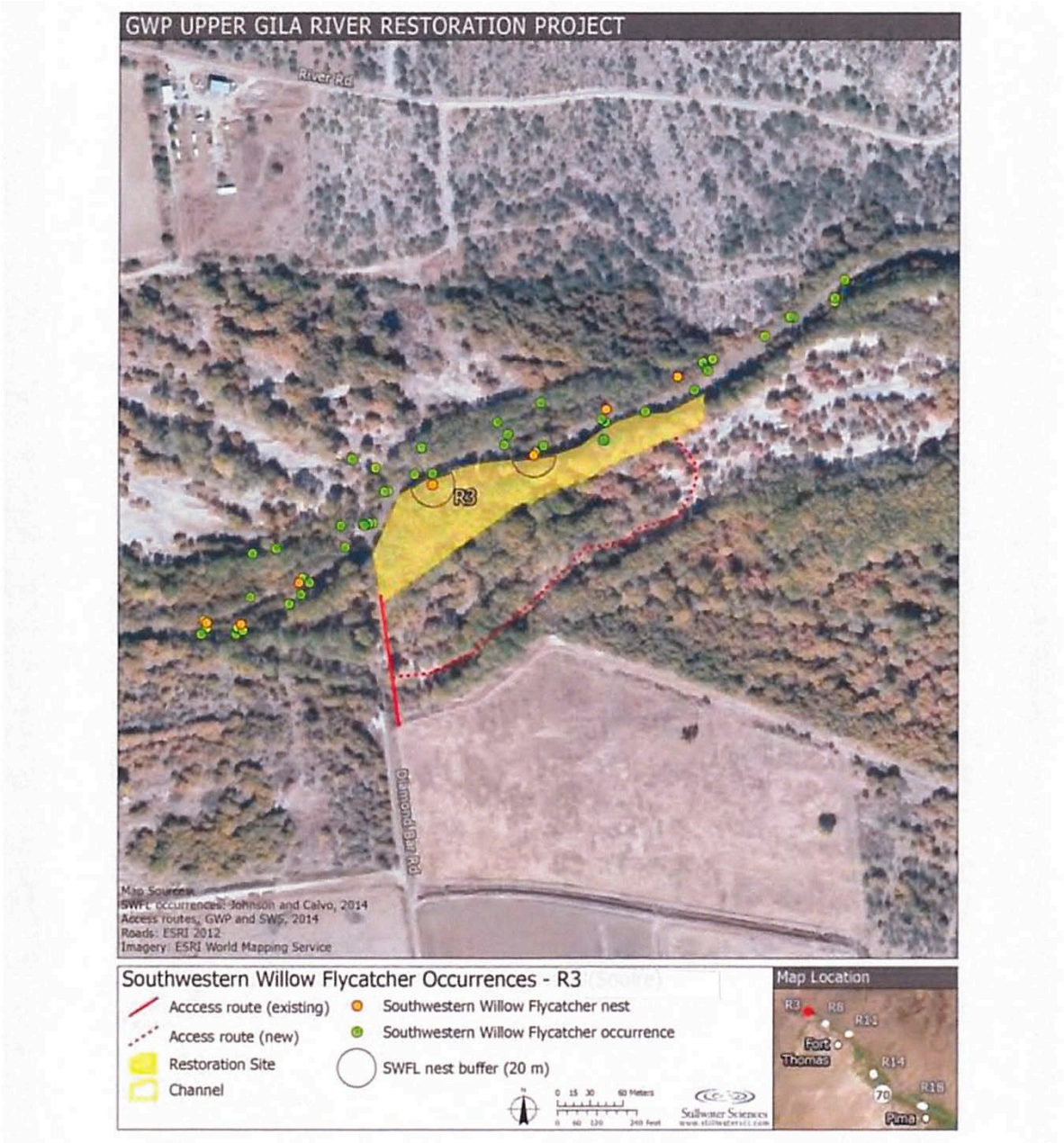

Figure 7: SWFL occurrences in the vicinity of vegetation management site R3 (Johnson and Calvo, unpublished data).

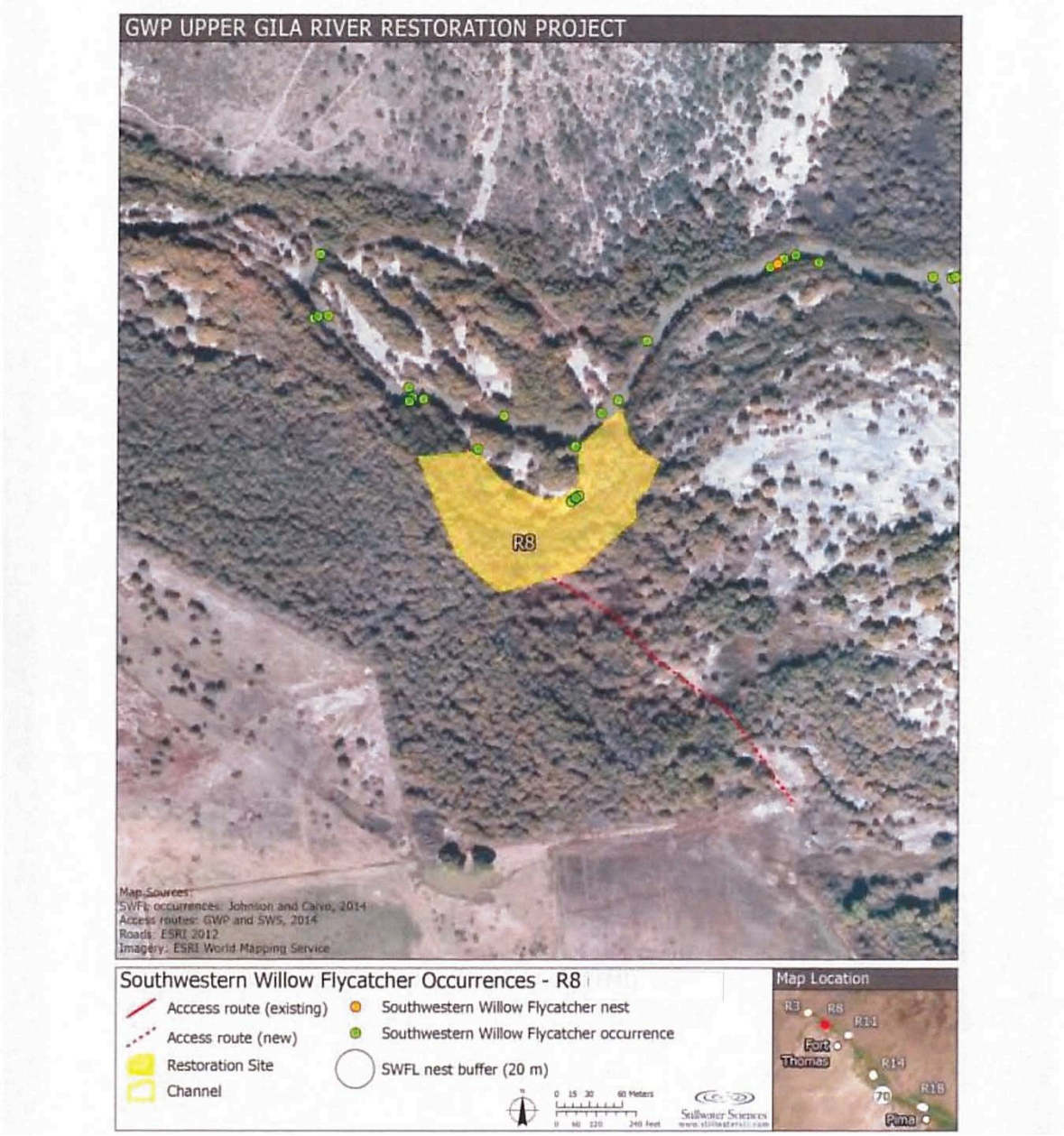

Figure 8: SWFL occurrences in the vicinity of vegetation management site R8 (Johnson and Calvo, unpublished data).

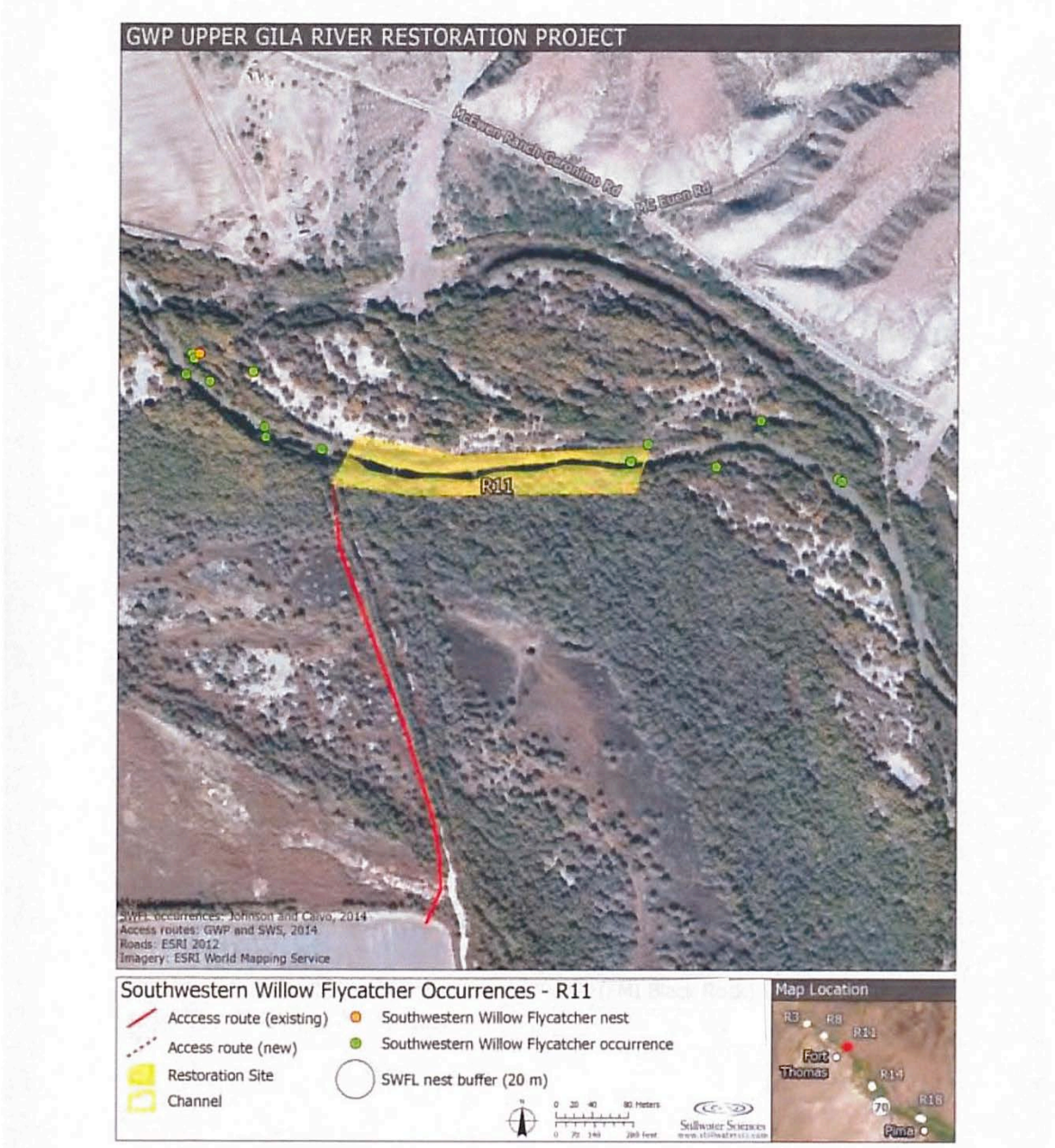

Figure 9: SWFL occurrences in the vicinity of vegetation management site R11 (Johnson and Calvo, unpublished data).

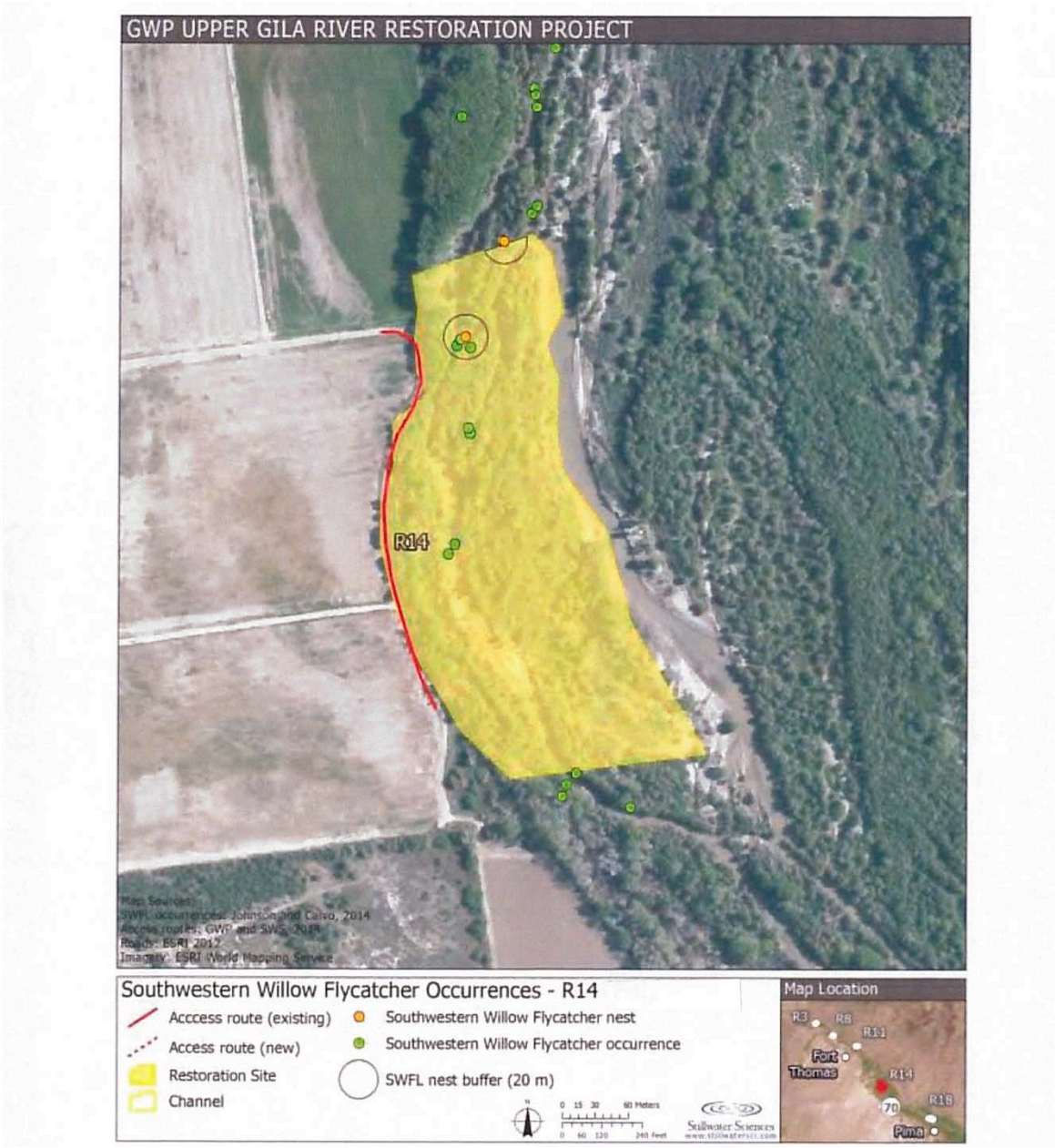

Figure 10: SWFL occurrences in the vicinity of vegetation management site R14 (Johnson and Calvo, unpublished data).

Figure 11: SWFL occurrences in the vicinity of vegetation management site R18 (Johnson and Calvo, unpublished data).

Western yellow-billed cuckoo

In the action area, very little information exists on WYBC distribution and abundance. The only observations in the past nine years 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 non-native-dominated (>75% non-native tree

species). Surveys in mixed native and non-native 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.

As a part of the planning phase for this project, Johnson and Calvo (unpubl. data) documented all WYBC detections (visual and vocalizations) during USFWS-protocol (Sogge *et al.* 2010) surveys for SWFL at the vegetation management sites in 2014. Approximately 20 WYBC detections occurred in the vicinity of the vegetation management sites. 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 have been detected 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 nest, or are 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.

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.

B. FACTORS AFFECTING SPECIES ENVIRONMENT WITHIN THE ACTION AREA

The action areas surrounding the five 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 1). Along this segment of river and within the action areas, 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 specific action areas, 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% of the time (as recorded at both gages), and less than 100 cfs and 10 cfs for 10% 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 can 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; there is an abundance of very dense riparian and wetland vegetation along the discharge. The 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 restoration site R18 that is likely a combination of tributary flow, road-runoff, and agricultural return flows; R14 is directly adjacent to a seasonally irrigated field with ditches that may discharge run-off into the site occasionally; 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% 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% 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).

EFFECTS OF THE ACTION

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

Southwestern Willow Flycatcher

The project is being implemented by the Gila Watershed Partnership in anticipation of the of the impending arrival of the tamarisk leaf beetle, which defoliates and kills the non-native tamarisk that currently provides nesting habitat for SWFLs in the project area. The goal 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 September 30 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 very high site fidelity to the location of breeding patches, returning to the same location to breed annually (USFWS 2002). It is anticipated that the individuals that established nest territories last year would return in 2015. 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.

The removal of riparian vegetation at the five vegetation management sites will have temporal indirect effects to nesting SWFLs by altering/removing nesting and foraging habitat and overall breeding habitat quality. With a total of 254 SWFL detections in 2014 at and around all five management sites, 14 SWFL nests and 39 territories were detected. Territories and nests were detected at each of the five management sites. While small buffers (65 ft) will be placed around known nest sites from 2014, not all nest sites were sought out within the management sites or 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 54.4 acres of riparian habitat from these 5 management areas is anticipated to remove vegetation from within SWFL territories, important habitat surrounding territory boundaries, and likely undetected areas used for nest placement.

Loss of nesting habitat and alteration of nesting habitat quality at the management areas, prior to the re-establishment of native woody species is expected to adversely affect breeding SWFLs. As a result of alteration of vegetation abundance, density, and overall quality, we can anticipate a reduced number of territories and nesting attempts. From those SWFLs that do attempt to nest, we can also expect reduced SWFL productivity (number of nesting attempts, eggs laid and hatched, nestlings, and nestling fledged) from reduced habitat quality and increased levels of predation and brood parasitism. 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. Increased habitat fragmentation and reduced cover reduces vegetation density and therefore improves access to SWFL eggs and nestlings, thereby increasing the rate of predation and brood parasitism (USFWS 2014c).

The selective clipping of willow and cottonwood cuttings for propagation could also affect nesting and foraging habitats, but the conservation measures minimize the risk of impacts by limiting the amounts and locations of such cuttings. Clippings will be made either from areas within the vegetation management sites (suitable habitat) or where SWFLs are not expected to be found to nest, such as along irrigation ditches.

The long-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. Therefore, replacement of removed tamarisk by planted native riparian woody species can be expected to take approximately five years. Also, due to the presence of nesting SWFL habitat upstream and downstream of the action area, there is a reasonable likelihood the same SWFLs will be able to find other nesting locations along the Gila River to successfully nest. Additionally, 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.

Because of the removal of 54.4 acres of habitat is such a small fraction of the overall amount of riparian habitat across this 23-mile segment of the upper Gila River, we do not anticipate significant impacts to occur to migrating SWFLs. 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. 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.

Some access routes to treatment patches would require vegetation clearance to provide vehicle access for transporting crews, equipment, and materials. While access routes would be determined after ground-truthing of vegetation management site and surrounding conditions, and final routes would be located using best efforts to avoid occupied or highly suitable SWFL habitat, no more than 300 feet (0.06 mile, or 0.08 acre assuming a 12-foot-wide road) of new access route clearing would occur in occupied or highly suitable SWFL habitat. Once access routes are no longer needed they will be reclaimed. However, this would result in a short-term loss of habitat.

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 expected (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 expected 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 54.4 acres of suitable habitat will be temporarily affected by tamarisk removal and access route clearing activities. 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 54 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, prone to devastating floods, the primary benefit of this project is expected to be realized until the next large flood event occurs.

Western Yellow-billed Cuckoo

In the action area, very little information exists on WYBC distribution and abundance due to the lack of surveys. The proposed conservation measures are anticipated to be effective in reducing the direct adverse effects of the proposed action. Scheduling vegetation removal activities during the September 30 to April 14 work period will avoid direct effects during the nesting season while WYBC are on their wintering grounds. Therefore, no direct impacts to WYBC, their nesting attempts, eggs, or young are expected to occur.

Breeding site fidelity of WYBCs has been difficult to study and there is limited information on whether WYBC return to breed in the same area in which they hatched or nested in a previous year (USFWS 2013b). The available data show that adults and nestlings do return to the same or nearby nesting sites in successive years (Laymon 1998). It is expected that the individuals that established nest territories last year would return in 2015. Vegetation management in the area may temporally change the habitat conditions at the five 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.

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. At the landscape level, the amount of cottonwood–willow-dominated vegetation cover and the width of riparian habitat influences YBCU distribution and abundance (Gaines and Laymon 1984). Recent radio telemetry studies on the Rio Grande in New Mexico, the San Pedro River in Arizona, and the Colorado River in Arizona and California have shown that WYBC use large home ranges between 95 acres (38 hectares) and 204 acres (82 ha) (USFWS 2013). Collectively these vegetation management sites (54.4 acres) are smaller than the average home range of the WYBC and are spread out along 23 miles of the Gila River, surrounded by riparian vegetation that the WYBC can use.

The selective clipping of willow and cottonwood cuttings for propagation could also affect nesting and foraging habitats, but the 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. 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. Therefore, replacement of removed tamarisk by planted native riparian woody species can be expected to take approximately five years. Also, due to the presence of WYBC habitat upstream and downstream of the action area, there is a likelihood the same WYBC will be able to find other nesting locations along the Gila River to successfully nest. Additionally, 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.

Some access routes to treatment patches would require vegetation clearance to provide vehicle access for transporting crews, equipment, and materials. While access routes would be determined after ground-truthing of vegetation management site and surrounding conditions, and final routes would be located using best, no more than 300 feet (0.06 mile, or 0.08 acre assuming a 12-foot-wide road) of new access route clearing would occur in occupied or highly suitable SWFL habitat. Tamarisk removal and access road clearing will temporarily reduce the amount of WYBC suitable habitat.

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 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 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, which, absent the project**.**

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 7 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

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. 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 to cause 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 54.4 acres is not expected to affect the persistence of SWFL along the upper Gila River. 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 54.4 acres of currently utilized SWFL nesting habitat, through vegetation clearing and grading. This habitat will be restored through revegetation techniques and is expected to be functional for nesting SWFL within five years.

- Implementation of the conservation measures (see the Description of the Proposed 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 54.4 acres of critical habitat (approximately 1.2 miles of Gila River) to be minor compared to overall amount of critical habitat designated within the Upper Gila Management Unit. The project represents approximately 0.03 percent of the 47.5 mile designated stream length of the Gila River in the Upper Gila Management Unit and 0.0002 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, it is anticipated that all 54.4 acres of

habitat will be restored to suitable habitat once native vegetation is established. Also, the effects will be temporary in nature and within 5 years it is anticipated that a native riparian community will be established within these 54.4 acres.

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. We present these conclusions for the following reasons:

- WYBCs are known to breed within riparian vegetation along the Gila River and were detected within the project area during SWFL surveys. WYBCs are known to breed within riparian vegetation along the Gila River upstream and downstream of the proposed management sites. However, impacts from this project are temporary impacts and are not expected to cause any population level impacts. WYBC are found nearby, and at Fort Thomas downstream of the action area, approximately 5 to 6 pairs were detected during surveys in 2012 (SRP 2012). The proposed project is not expected to affect the persistence of cuckoos along the upper Gila River because loss of territories from 54.4 acres is temporary, WYBC are present upstream and downstream on the Gila River, and the patches of tamarisk planned for removal are smaller than the home range size of the WYBC the proposed project is not expected to affect the persistence of WYBCs. 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 54.4 acres of currently utilized habitat, through vegetation clearing and grading but, this habitat will 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 the Description of the Proposed Conservation Measures section above) would greatly minimize negative impacts to nesting WYBCs, as well as occupied, suitable, and potential habitat, although WYBCs may still experience breeding displacement effects from the proposed project.

- We anticipate minor effects to proposed PCEs 1, and 2 on 54.4 acres, or approximately 0.003 percent, of the 20,726 acres of riparian habitat along the Gila River in the Gila River proposed Critical Habitat Unit 36 and 0.00009 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 raise to a level of significance to impact the function of proposed critical habitat. Additionally, the effects will be temporary in nature and within 5 years it is anticipated that a native riparian community will be established within these 54.4 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 any Conservation Measures that were incorporated into the project design.

INCIDENTAL TAKE STATEMENT

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

The measures described below are non-discretionary, and must be undertaken by the 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 take of SWFL as a result of this proposed action. Although SWFL are migratory and spend only part of the year at the construction site, 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.

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).

These variations in the size of breeding patches used by SWFL and the number of nesting SWFL within a patch of habitat makes it impossible to predict exactly 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.

The SWFL habitat within these management areas is expected to be removed/altered, but vegetation is also expected to be re-established by replanting. 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 temporary removal and alteration of SWFL nesting habitat we anticipate that the project will result in harm or harassment of all breeding SWFLs in the 54.4 acres in year one, and continue to harm some or all SWFLs in years 2 through 5 in approximately all 54.4 acres. Removal 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). Alternately, incidental take will be considered to have been exceeded if an evaluation of the management 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

The USFWS does not anticipate the proposed action will incidentally take any WYBCs for the following reasons**:**

- The conservation measures will ensure that direct effects to WYBC are avoided by implementing the proposed project during the non-breeding season.
- In the action area, very little information exists on WYBC distribution and abundance. WYBC were incidentally detected during SWFL surveys within the action area in areas

with mature cottonwoods and willows with a tamarisk/willow understory. WYBC are found on nearby properties wehere WYBC surveys are conducted in similar habitat. Native vegetation will not be targeted for vegetation management and indirect effects to proposed constituent elements will be minimized.

- The project will occur on a relatively small area compared to the home range size of the WYBC and suitable habitat is available adjacent to the proposed vegetation management areas.

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 Southwestern Willow flycatcher:

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.

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.

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.

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 and abundance 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?

Yellow-billed cuckoo

1. We recommend the GWP conduct searches throughout the action area in areas of suitable habitat to determine the distribution, abundance, and nest locations of WYBCs.

2. 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.

3. 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.

REINITIATION NOTICE

This concludes 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 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.

After listing as threatened or endangered and any subsequent adoption of this conference opinion, the Federal agency shall request reinitiation of consultation if: 1) the amount or extent of incidental take is exceeded; 2) new information reveals effects of the agency action that may affect the species in a manner or to an extent not considered in the conference opinion; 3) the agency action is subsequently modified in a manner that causes an effect to the species that was not considered in this opinion; or 4) a new species is listed or critical habitat designated that may be affected by the action.

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

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 Jennifer Kaplan (602) 242-0210 (x213) or Kris Randall (602)-242-0210 (x250). Please refer to the consultation number, 02EAAZZ00-2014-F-0151, in future correspondence concerning this project.

Sincerely,

/s/ Steven L. Spangle
Field Supervisor

cc: (hard copies)
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ

cc: (electronic copies)
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ
Greg Beatty, Fish and Wildlife Biologist, Fish and Wildlife Service, Phoenix, AZ
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Leigh Kuwanwisiwma, Director Cultural Preservation Office, Hopi Tribe, Kykotsmovi, AZ
Vernelda Grant, Director, Tribal Historic Preservation Office, San Carlos Apache Tribe, San Carlos, AZ
Ramon Riley, Director, Cultural Resources, White Mountain Apache Tribe, Whiteriver, AZ

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APPENDIX A
CONCURRENCE – RAZORBACK SUCKER

This appendix contains our concurrences with your "may affect, not likely to adversely affect" determinations for the endangered razorback sucker (*Xyrauchen texanus*).

Razorback sucker were listed as endangered in 1991 (USFWS 1991) and critical habitat was designated in 1994 (USFWS 1994). Primary Constituent Elements (PCEs) of critical habitat for razorback sucker include: (1) suitable water quality and quantity, (2) suitable physical habitat within the Colorado River system for spawning, nursery, rearing, and feeding, as well as corridors between such areas, and (3) the biological environment including living components of the food supply and interspecific interaction (USFWS 1994). In the Gila River, critical habitat for razorback sucker is designated from the Arizona/New Mexico border to Coolidge Dam, where water quantity and quality are suitable (USFWS 1998).

We concur with your determination that the proposed action may affect, but is not likely adversely affect, razorback sucker critical habitat. Project implementation may temporarily affect water quality, a PCE of designated critical habitat for razorback sucker. Water quality could be affected periodically due to increased turbidity from stream-side tamarisk cutting and mulching, herbicide use, stream crossings by foot or machine, and streambank recontouring activities during implementation. There could be short-term increases in water temperature and decreases in dissolved oxygen as a result of reduced riparian shading between the period when tamarisk is removed and the native riparian canopy establishes. These effects would, however, be temporary as we anticipate the project's revegetation efforts would eventually replace the patches of removed tamarisk, and would likely be minimal due to the use of treatment patches, which would prevent large areas of streamside vegetation removal.

All vegetation will be removed followed by a selective application of an appropriate herbicide. Only target non-native species will be removed. All three herbicides that may be used [triclopyr (amine salt formulation), glyphosate (aquatic formulation), or imazapyr (aquatic formulation) have a toxicity rating of 0 for warm water fish. Class 0 pesticides ordinarily do not require protection measures for animal species within the *Recommended Protection Measures for Pesticide Applications in Region 2 of the U.S. Fish and Wildlife Service* (USFWS 2004). The first year triclopyr (ester formulation) will be used. This herbicide has a toxicity rating of 2 for warm water fish. The *Recommended Protection Measures for Pesticide Applications in Region 2 of the U.S. Fish and Wildlife Service* (USFWS 2004) is to have a 20 foot buffer when using this class herbicide. To ensure that effects to water quality are insignificant when working within 20 feet of the Gila River and other aquatic habitats, all herbicide will only be applied by hand "painting" (backpack sprayers will not be used). Due to the small area that this herbicide is being applied and the targeted application method to ensure no spray drift we consider the effects of the action will be insignificant. We believe the proposed project may effect, but is not likely to adversely affect razorback sucker critical habitat.

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