Appendix M

BIOLOGICAL AND CONFERENCE OPINION AND CONFERENCE REPORT AND AMENDMENT FOR THE SOUTHLINE TRANSMISSION LINE PROJECT

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Las Cruces District Office
1800 Marquess Street
Las Cruces, New Mexico 88005
www.blm.gov/nm

TAKE PRIDE IN AMERICA

In Reply Refer To:

6841 (L0000)

JUL 27 2015

Memorandum

To: Field Supervisor, Arizona Ecological Services Office, USFWS, Phoenix, AZ

From: District Manager, Las Cruces, BLM, Las Cruces, NM

Subject: Request to Amend the Biological and Conference Opinion and Conference Report on the Proposed Southline Transmission Project with an Update to the Agency Preferred Alternative for the Final Environmental Impact Statement (EIS)

The Bureau of Land Management (BLM) and the Western Area Power Administration (Western) initiated formal consultation and conference on March 4, 2014, for the proposed Southline Transmission Project located in Doña Ana, Luna, Grant, and Hidalgo Counties, New Mexico; and Greenlee, Graham, Cochise, Pima, and Pinal Counties, Arizona. We received a draft biological opinion and conference report (BO) dated November 10, 2014. This draft BO included an analysis of impacts to the following species: the endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*), the endangered Mexican long-nosed bat (*Leptonycteris nivalis*), the endangered Pima pineapple cactus (*Coryphantha scheeri* var. *robustispin*a), the endangered southwestern willow flycatcher (*Empidonax traillii extimus*), the endangered Gila chub (*Gila intermedia*) and its critical habitat, the endangered Huachuca water umbel (*Lilaeopsis schaffneriana* var. *recurva*), the threatened northern Mexican gartersnake (*Thamnophis eques megalops*) and its proposed critical habitat, the threatened yellow-billed cuckoo (*Coccyzus americanus*) western distinct population and its proposed critical habitat, and the non-essential population of northern aplomado falcon (*Falco femoralis septentrionalis*).

The draft BO analyzed impacts on listed species from segment P7 near the Willcox Playa in Arizona. Segment P7 would be a new approximately 20-mile, 345-kV transmission line segment that would parallel an existing 230-kV line. This segment was analyzed in the February 2014 biological assessment and the Draft EIS. During review of the Draft EIS, the Arizona Game and Fish Department (AZGFD) and the U.S. Fish and Wildlife Service raised concerns about potential impacts to sandhill cranes (*Grus canadensis*) because of the route's proximity to the Willcox Playa Wildlife Area, an area managed by the AZGFD, and Crane Lake. In a letter dated July 10, 2014, the AZGFD recommended that the BLM and Western consider an alternative route to reduce impacts to this species. They suggested a reroute on the eastern side of the

Sulphur Springs Valley, which became P7a (an approximately 30-mile long route variation) and was part of the new Agency Preferred Alternative in the Administrative Final EIS. This was the route segment analyzed in the final BO, dated December 30, 2014.

During the Administrative Final EIS review process, the BLM sent letters to over 1,000 landowners along Route Variation P7a and received numerous response letters of concern, particularly from owners and operators of vineyards and wineries in the area. Because of these concerns, the BLM and Western have decided to return to the original segment P7 as the Agency Preferred Alternative in the Final EIS.

Subsequent discussions with the AZGFD were held to address impacts to the sandhill crane with segment P7 as the Agency Preferred Alternative in the Final EIS. In a letter dated June 21, 2015, the AZGFD provided suggested measures that they feel would satisfactorily minimize or mitigate impacts to the Willcox Playa Wildlife Area. One of the measures would be to relocate Crane Lake, which would minimize potential bird strikes and therefore minimize impacts to cranes.

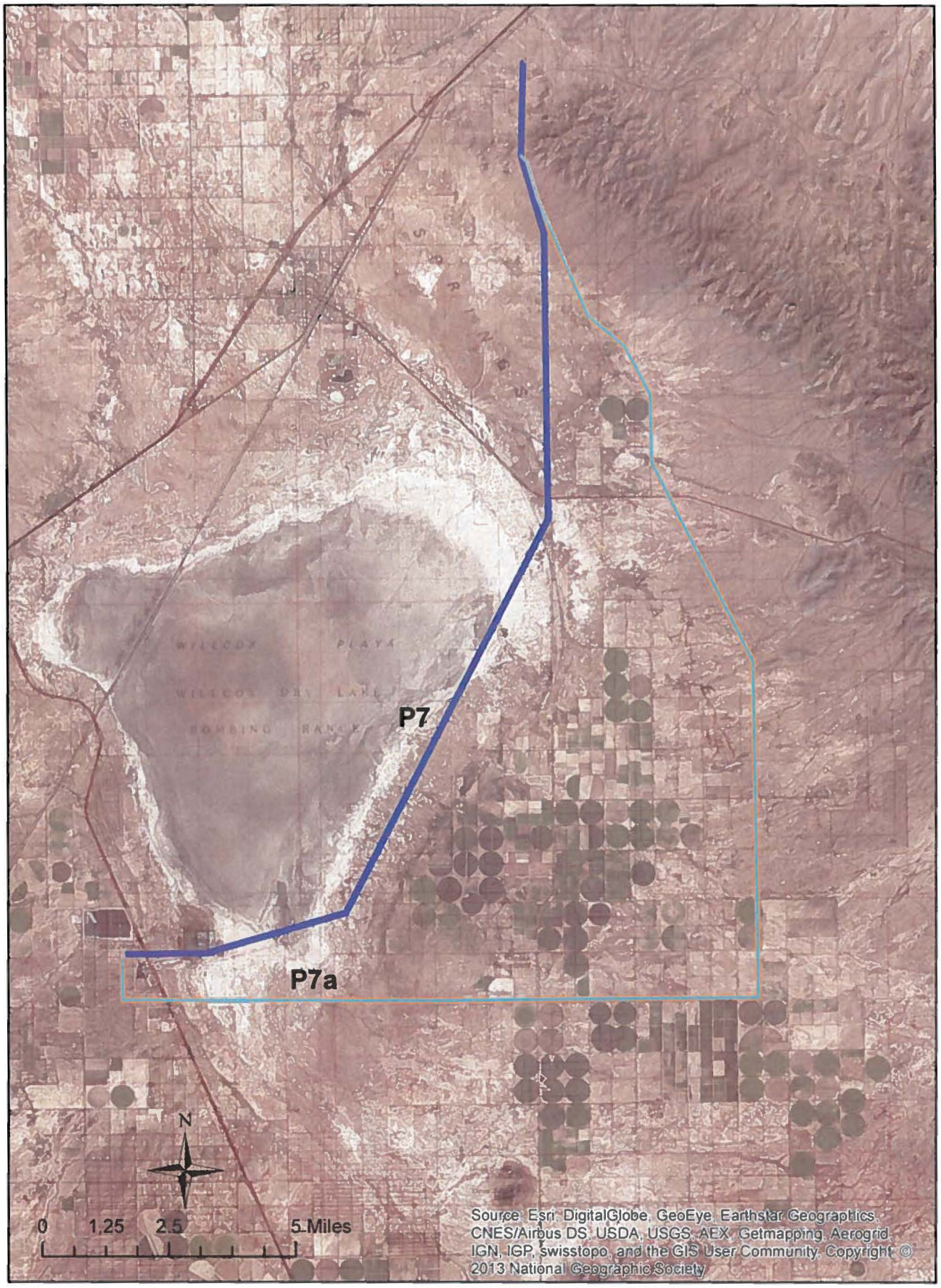
The BLM and Western have determined that the effect on listed species (i.e., the lesser-long nosed bat) from segment P7 and route variation P7a are essentially the same. Vegetation communities along both routes are similar, with the main vegetation communities being Apacherian-Chihuahuan Piedmont Semi-Desert Grassland and Steppe (65 percent), and Apacherian-Chihuahuan Mesquite Upland Scrub (25 percent). The only listed species with potential to occur along either route is the lesser-long nosed bat. There are no known roosts along either route. Impact to the species would be from potential loss of foraging habitat. However, as mentioned in the BO, forage plants would not be affected to the extent that would preclude this species from foraging within the area because of the relatively small area of forage that would be affected.

The BLM and Western are requesting an amendment to the biological opinion and conference opinion to include segment P7 as the Agency Preferred Alternative for the Final EIS. Questions concerning this consultation may be directed to Mark Massar, BLM Wildlife Biologist, at (760) 833-7121 or mmassar@blm.gov.

Bill Childress

1 Attachment:
1 – Attachment A. Routes P7 and P7a

Attachment A. Routes P7 and P7a



United States Department of the Interior
Fish and Wildlife Service
Arizona Ecological Services Office
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 Fax: (602) 242-2513

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December 30, 2014

Memorandum

RC 1/6/15

To: District Manager, Bureau of Land Management, Las Cruces, New Mexico

From: Field Supervisor, Arizona Ecological Services Office

Subject: Biological and Conference Opinion and Conference Report on the Proposed Southline Transmission Project

Thank you for your request for formal consultation and conference with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated March 4, 2014, and received by us on March 4, 2014. At issue are the impacts that may result from the proposed Southline Transmission Project located in Doña Ana, Luna, Grant, and Hidalgo counties, New Mexico, and Greenlee, Graham, Cochise, Pima, and Pinal counties, Arizona. You determined that the proposed action may affect, and is likely to adversely affect, the endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*), the endangered Mexican long-nosed bat (*Leptonycteris nivalis*), the endangered Pima pineapple cactus (*Coryphantha scheeri var. robustispina*), and the endangered southwestern willow flycatcher (*Empidonax traillii extimus*).

In your memorandum, you requested our concurrence that the proposed action may affect, but is not likely to adversely affect, the endangered Gila chub (*Gila intermedia*) and its critical habitat and the endangered Huachuca water umbel (*Lilaeopsis schaffneriana* var. *recurva*). We concur with your determinations and provide our rationale in Appendix A.

In addition, you requested conference for effects of the proposed action on proposed threatened northern Mexican gartersnake (*Thamnophis eques megalops*) and its proposed critical habitat, and on the proposed threatened yellow-billed cuckoo (*Coccyzus americanus*) western distinct population. On September 23, 2014, you changed your request for a formal conference to a request for a formal consultation regarding the effects of the proposed action on the northern Mexican gartersnake because it was listed as threatened since your March 4, 2014, request. On October 10, 2014, you changed your request for a formal conference to a request for a formal consultation regarding the effects of the proposed action on the yellow-billed cuckoo because it was listed as threatened since your March 4, 2014 request, and you also requested a formal

conference on yellow-billed cuckoo proposed critical habitat, which was proposed since your request of March 4, 2014. Therefore, we are also providing formal consultation for the northern Mexican gartersnake and the yellow-billed cuckoo, and formal conference for the proposed critical habitat for these species, all of which are presented in the main body of this biological and conference opinion.

You also requested conference for effects of the project on the non-essential population of northern aplomado falcon (*Falco femoralis septentrionalis*), which is provided through a conference report as Appendix B. You also requested technical assistance for effects of the project on candidate species Sonoran desert tortoise (*Gopherus morafkai*) and Sprague's pipit (*Anthus spragueii*) which is provided in Appendix C. You also requested technical assistance for the effects of the project on the Tucson shovel-nosed snake (*Chionactis occipitalis klauberi*). On September 23, 2014, we found that listing the Tucson shovel-nosed snake as an endangered or threatened species is not warranted and we removed this subspecies from our candidate list. Therefore, we are not providing technical assistance for this former candidate species.

This biological and conference opinion and conference report is based on information provided in the February 2014 "Biological Assessment for the Southline Transmission Project," the March 2014 "Proposed Southline Transmission Line Project Draft Environmental Impact Statement and Draft Resource Management Plan Amendment," telephone conversations, field investigations, 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, transmission line construction 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

- March 4, 2014. We received your request for formal consultation and conference.
- July 9, 2014. We sent you a request for an additional 60 days to complete formal consultation.
- August 4, 2014. We received your concurrence for an additional 60 days to complete formal consultation.
- September 23, 2014. We received your request to change from a conference opinion to biological opinion for the recently listed northern Mexican gartersnake
- October 10, 2014. We received your request to change from a conference opinion to a biological opinion for the recently listed yellow-billed cuckoo, and for a conference opinion regarding yellow-billed cuckoo proposed critical habitat.
- November 10, 2014. We sent you the draft biological and conference opinion for review and comment.
- December 17, 2014. We received your comments on the draft biological and conference opinion along with the amendment to the Biological Assessment.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

The proposed action is: for the BLM to issue a right-of-way grant to Southline Transmission, LLC (Southline) for the construction and operation of a 345 kV transmission line from the Afton Substation in New Mexico to the Apache Substation in Arizona (BO Figure1); for Western Area Power Administration (Western) to authorize and participate with Southline in the upgrade an existing Western transmission line and associated facilities from 115 kV to 230 kV from Apache Substation to Saguaro Substation in Arizona (BO Figure 1); for the U.S. Forest Service to authorize the upgrade of the Western line across Forest Service managed land in Cochise County, Arizona; and for the U.S. Bureau of Reclamation (Reclamation) to authorize the upgrade of the Western line across Reclamation managed lands in Pima and Pinal counties, Arizona. Because multiple Federal agencies have actions that are required by the project, this BCO evaluates all of these proposed actions and provides section 7 compliance for all of these agencies' actions. The BLM is acting as the lead action agency with regard to this consultation.

The Southline Transmission Line Project (project) is a proposed electrical transmission line project that would consist of two sections. The first section would entail construction of approximately 240 miles of new double-circuit 345-kilovolt (kV) transmission line in a 200-foot right-of-way (ROW) between the Afton Substation, south of Las Cruces in Doña Ana County, New Mexico, and Western's Apache Substation, south of Willcox in Cochise County, Arizona (New Build Section). The second section would entail the upgrade of approximately 120 miles of Western's existing Saguaro–Tucson and Tucson–Apache 115-kV transmission lines to a double-circuit 230-kV transmission line in a 100-foot existing ROW (Upgrade Section). The Upgrade Section would originate at the Apache Substation and terminate at the Saguaro Substation northwest of Tucson in Pinal County, Arizona (BO Figure 1). Both new permanent ROW and temporary construction ROW would be required in the New Build Section and in some portions of the Upgrade Section for the transmission line, substations, access roads, and other permanent and temporary project components; the anticipated ROW width for the Upgrade Section 230-kV transmission line would be 150 feet. The proposed project would also include installation of new communications equipment, and connect to 14 substations distributed throughout southern New Mexico and Arizona, including expanding/upgrading existing substations and potentially constructing a new substation in Luna County, New Mexico. The proposed project would also include installation of new communications equipment to facilitate operations. The proposed action includes proponent committed environmental measures, best management practices (BMPs), and additional proposed species-specific conservation measures (BA Table 3-7 included as Appendix D of this BO).

On December 17, 2014, you provided an amendment to your Biological Assessment with an updated project description (route changes) and an updated effects analysis for Leptonycteris bats. The route changes would occur in route group 2 and 4. You concluded that the route changes would not change the effects analysis or determinations for any listed species.

The proposed action includes maintenance activities, which includes inspecting portions of the line by air and ground, repair of structures and electrical equipment, access road maintenance,

clearing vegetation as necessary to minimize fire hazard or physical impedance of the transmission line, and noxious plant control. Maintenance of vegetation would be done using mechanical and manual equipment, such as weed trimmers, rakes, shovels, mowers, brush hooks, and, occasionally as need, chainsaws. Although unlikely to be necessary, species-dependent herbicide could be applied subsequent to vegetation clearing to prevent regrowth of that vegetation and/or noxious and invasive weeds. Emergency maintenance may be needed to repair downed wires during storms and correct unexpected outages, and repair or replace damaged equipment.

Action Area

The action area for this BO is defined as a 1-mile buffer on either side of the centerline of the Agency Preferred Alternative in the New Build Section and a 500-foot corridor (200 feet off of the existing 100-foot-wide ROW) (see BO Figure 1) in the Upgrade Section, as well as any identified substations, staging areas, or access roads outside those corridors.

Term of ROW (New Build Section)

The term of the BLM right-of-way grant to allow use of Federal land within the New Build Section of the proposed project would be limited to 50 years.

Conservation Measures

<u>Lesser Long-nosed Bat and Mexican Long-nosed Bat</u>

LNB-1: All paniculate agaves (*Agave palmeri*, *A. parryi*, and *A. chrysantha*) and saguaros would be inventoried within the proposed ROW, and the potential to avoid or salvage each plant would be assessed. The priority would be avoidance when feasible.

LNB-2: All suitable (e.g., healthy, undamaged, not flowering) paniculate agaves that could not be avoided would be salvaged using methods approved by the BLM/Western and FWS, but mature agaves would be given preference for avoidance when feasible. Plants salvaged from areas of permanent disturbance would be used to reclaim areas of temporary disturbance, or replanted outside disturbed areas if necessary.

LNB-3: Saguaros less than 15 feet in height would be salvaged, unless prevented by site-specific conditions or poor plant health. Plants salvaged from areas of permanent disturbance would be used to reclaim areas of temporary disturbance, or replanted outside of disturbed areas if necessary. Larger saguaros would be avoided whenever feasible, but would be topped or removed if necessary.

LNB-4: Agave and saguaro salvage would be augmented, as necessary, within three years after completion of initial restoration activities. Augmentation would occur within the ROW in areas of higher value to bats (e.g., in the vicinity of active roosts, within areas of high concentration of agaves) to achieve a goal of no net loss of forage plants. Plant stocks from local sources or approved nursery-grown plants would be used.

LNB-5: Salvaged plants would be monitored following reclamation for a period of 3 years, as described in the POD. Supplementary water would be provided, if monitoring indicates that

rainfall is insufficient to achieve the goal of no net loss of forage plants. Plant survival through the monitoring period would be reported annually to the BLM/Western and FWS.

Pima Pineapple Cactus

PPC-1: Any Pima pineapple cactus that are not within the area of permanent disturbance, but are present within the project vicinity, shall be flagged by a qualified biologist prior to the commencement of work to avoid accidental damage during construction. Flagging will be removed following construction.

PPC-2: Any Pima pineapple cactus that cannot be avoided would be conserved by relocating plants within the existing ROW, but outside of the area of any ongoing disturbance.

PPC-3: For Pima pineapple cactus that cannot be avoided. Southline will purchase credits in an FWS-approved conservation bank for Pima pineapple cactus, corresponding to the area of permanent disturbance to occupied Pima pineapple cactus habitat. Alternatively, Southline my purchase suitable mitigation lands within Pima County's Pima pineapple cactus priority conservation areas.

PPC-4: In compliance with Executive Order 13112 regarding invasive species, all disturbed soils that will not be landscaped or otherwise permanently stabilized by construction shall be seeded using species native to the project vicinity.

PPC-5: Also in compliance with Executive Order 13112 regarding invasive species, all earth-moving and hauling equipment shall be washed at the contractor's storage facility prior to arriving on site to prevent the introduction of invasive species.

PPC-4: To prevent invasive species propagules from leaving the site, the contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.

Southwestern Willow Flycatcher

WF-1: All non-emergency construction and maintenance in riparian woodlands at the San Pedro River, Cienega Creek, and the Santa Cruz River would take place between September 15 and March 1, to avoid disturbance of breeding or nesting southwestern willow flycatchers.

WF-2: Line marking devices would be placed at the proposed crossings of the San Pedro River, Cienega Creek, and the Santa Cruz River to minimize the potential for avian collisions with transmission lines.

Northern Mexican Gartersnake

No specific conservation measures are proposed for the northern Mexican gartersnake because the proposed action minimizes ground and vegetation disturbance within the riparian habitat and proposed critical habitat at Cienega Creek and the San Pedro River (see Effects of the Action). However, some conservation benefit to the gartersnake is derived by shortened construction time frames proposed as conservation measures for the yellow-billed cuckoo and southwestern willow flycatcher.

Yellow-billed Cuckoo

YBC-1: All non-emergency construction and maintenance in riparian woodlands at the San Pedro River, Cienega Creek, and Santa Cruz River would take place between September 15 and March 1, to avoid disturbance of breeding or nesting yellow-billed cuckoos.

YBC-2: Line marking devices would be placed at the proposed crossings of the San Pedro River and Cienega Creek to minimize the potential for avian collisions with transmission lines.

STATUS OF THE SPECIES AND CRITICAL HABITAT

Lesser Long-Nosed Bat

The lesser long-nosed bat was listed (originally, as *Leptonycteris sanborni*; Sanborn's long-nosed bat) as endangered in 1988 (53 FR 38456). No critical habitat has been designated for this species. A recovery plan was completed in 1997 (U.S. Fish and Wildlife Service 1997). Loss of roost and foraging habitat, as well as direct taking of individual bats during animal control programs, particularly in Mexico, have contributed to the current endangered status of the species. Recovery actions include roost monitoring, protection of roosts and foraging resources, and reducing existing and new threats. The recovery plan states that the species will be considered for delisting when three major maternity roosts and two post-maternity roosts in the U.S., and three maternity roosts in Mexico have remained stable or increased in size for at least five years, following the approval of the recovery plan. A five-year review has been completed and recommends downlisting to threatened (U.S. Fish and Wildlife Service 2007b).

Species Description

The lesser long-nosed bat is a medium-sized, leaf-nosed bat. It has a long muzzle and a long tongue, and is capable of hover flight. These features are adaptations for feeding on nectar from the flowers of columnar cacti (e.g., saguaro [*Carnegiea gigantea*]; cardon [*Pachycereus pringlei*]; and organ pipe cactus [*Stenocereus thurberi*]; and from paniculate agaves (e.g., Palmer's agave [*Agave palmeri*]) (Hoffmeister 1986).

Distribution and Life History

The lesser long-nosed bat is migratory and found throughout its historical range, from southern Arizona and extreme southwestern New Mexico, through western Mexico, and south to El Salvador. It has been recorded in southern Arizona from the Picacho Mountains (Pinal County) southwest to the Agua Dulce Mountains (Pima County) and Copper Mountains (Yuma County), southeast to the Peloncillo Mountains (Cochise County), and south to the international boundary; and in the boot heel of New Mexico (Hidalgo County).

Within the U.S., habitat types occupied by the lesser long-nosed bat include Sonoran Desert scrub, semi-desert and plains grasslands, and oak and pine-oak woodlands. Farther south, the lesser long-nosed bat occurs at higher elevations. Maternity roosts, suitable day roosts, and concentrations of food plants are all critical resources for the lesser long-nosed bat. All of the factors that make roost sites suitable have not yet been identified, but maternity roosts tend to be

very warm and poorly ventilated (U.S. Fish and Wildlife Service 1997). Such roosts reduce the energetic requirements of adult females while they are raising their young (Arends *et al.* 1995).

Roosts in Arizona are occupied from late April to September (Cockrum and Petryszyn 1991) and on occasion, as late as November (Sidner 2000); the lesser long-nosed bat has only rarely been recorded outside of this time period in Arizona (U. S. Fish and Wildlife Service 1997, Hoffmeister 1986, Sidner and Houser 1990). In New Mexico, lesser long-nosed bats typically occupy roosts in late summer and fall. In spring, adult females, most of which are pregnant, arrive in Arizona and gather into maternity colonies in southwestern Arizona. These roosts are typically at low elevations near concentrations of flowering columnar cacti. After the young are weaned, these colonies mostly disband in July and August; some females and young move to higher elevations, primarily in the southeastern parts of Arizona near concentrations of blooming paniculate agaves. Adult males typically occupy separate roosts forming bachelor colonies. Males are known mostly from the Chiricahua Mountains and, recently, the Galiuro Mountains (personal communication with Tim Snow, Arizona Game and Fish Department, 1999), but also occur with adult females and young of the year at maternity sites (U. S. Fish and Wildlife Service 1997). Throughout the night between foraging bouts, both sexes will rest in temporary night roosts (Hoffmeister 1986).

Lesser long-nosed bats appear to be opportunistic foragers and extremely efficient fliers. They are known to fly long distances from roost sites to foraging sites. Night flights from maternity colonies to foraging areas have been documented in Arizona at up to 25 miles, and in Mexico, at 25 miles and 36 miles (one way) (Ober *et al.* 2000; Dalton *et al.* 1994, Ober and Steidl 2004, Lowery *et al.* 2009). Lowery *et al.* (2009) and Steidl (personal communication, 2001) found that typical one-way foraging distance for bats in southeastern Arizona is roughly 6 to 18 miles. A substantial portion of the lesser long-nosed bats at the Pinacate Cave in northwestern Sonora (a maternity colony) fly 25-31 miles each night to foraging areas in OPCNM (U.S. Fish and Wildlife Service 1997). Horner *et al.* (1990) found that lesser long-nosed bats commuted 30-36 miles round trip between an island maternity roost and the mainland in Sonora; the authors suggested these bats regularly flew at least 47 miles each night. Lesser long-nosed bats have been observed feeding at hummingbird feeders many miles from the closest known potential roost site (Lowery *et al.* 2009; personal communication with Yar Petryszyn, University of Arizona 1997).

Lesser long-nosed bats, which often forage in flocks, consume nectar and pollen of paniculate agave flowers; and pollen and fruit produced by a variety of columnar cacti. Nectar of these cacti and agaves is high energy food. Concentrations of some food resources appear to be patchily distributed on the landscape, and the nectar of each plant species used is only seasonally available. Cacti flowers and fruit are available during the spring and early summer; blooming agaves are available primarily from July through October. In Arizona, columnar cacti occur in lower elevational areas of the Sonoran Desert region, and paniculate agaves are found primarily in higher elevation desert scrub areas, semi-desert grasslands and shrublands, and into the oak and pine-oak woodlands (Gentry 1982). Lesser long-nosed bats are important pollinators for agave and cacti, and are important seed dispersers for some cacti.

The conservation and recovery of lesser long-nosed bats requires the presence of secure and appropriate roost sites throughout the landscape (including maternity roost sites, as well as transitional and migration roost sites) and adequate forage resources in appropriate juxtaposition to provide for life history needs including breeding, parturition, and migration.

Status and Threats

Recent information indicates that lesser long-nosed bat populations appear to be increasing or stable at most Arizona roost sites identified in the recovery plan (Arizona Game and Fish Department 2005, Tibbitts 2005, Wolf and Dalton 2005, U.S. Fish and Wildlife Service 2007b; electronic mail from Tim Tibbitts 2009). Lesser long-nosed bat populations additionally appear to be increasing or stable at other roost sites in Arizona and Mexico not included for monitoring in the recovery plan (Sidner 2005, Arizona Game and Fish Department 2009). Less is known about lesser long-nosed bat numbers and roosts in New Mexico. Though lesser long-nosed bat populations appear to be doing well, many threats to their stability and recovery still exist, including excess harvesting of agaves in Mexico; collection and destruction of cacti in the U.S.; conversion of habitat for agricultural and livestock uses, including the introduction of bufflegrass, a non-native, invasive grass species; wood-cutting; alternative energy development (wind and solar power); illegal border activities and required law enforcement activities; drought and climate change; fires; human disturbance at roost sites; and urban development.

Approximately 25 – 30 large lesser long-nosed bat roost sites, including maternity and late-summer roosts, have been documented in Arizona and New Mexico. Of these, 10 – 20 are monitored on an annual basis depending on available resources (U.S. Fish and Wildlife Service 2007b). Monitoring in Arizona in 2004 documented approximately 78,600 lesser long-nosed bats in late-summer roosts and approximately 34,600 in maternity roosts. More recently, in 2008, the numbers were 63,000 at late-summer roosts and 49,700 at maternity roosts (Arizona Game and Fish Department 2009). Ten to 20 lesser long-nosed bat roost sites in Mexico are also monitored annually. Over 100,000 lesser long-nosed bats are found at just one natural cave at the Pinacate Biosphere Reserve, Sonora, Mexico (Cockrum and Petryszyn 1991). The numbers above indicate that although a relatively large number of lesser long-nosed bats exist, the relative number of known large roosts is quite small.

The primary threat to lesser long-nosed bat is roost disturbance or loss. The colonial roosting behavior of this species, where high percentages of the population can congregate at a limited number of roost sites, increases the risk of significant declines or extinction due to impacts at roost sites. Lesser long-nosed bats remain vulnerable because they are so highly aggregated (Nabhan and Fleming 1993). Some of the most significant threats known to lesser long-nosed bat roost sites are impacts resulting from use and occupancy of these roost sites by individuals crossing the border illegally for a number of reasons. Mines and caves, which provide roosts for lesser long-nosed bats, also provide shade, protection, and sometimes water, for border crossers. The types of impacts that result from illegal border activities include disturbance from human occupancy, lighting fires, direct mortality, accumulation of trash and other harmful materials, alteration of temperature and humidity, destruction of the roost itself, and the inability to carry out conservation and research activities related to lesser long-nosed bats. These effects can lead to harm, harassment, or, ultimately, roost abandonment (U.S. Fish and Wildlife Service 2005).

For example, the illegal activity, presumably by individuals crossing the border, at the Bluebird maternity roost site, caused bats to abandon the site in 2002, 2003, and 2005. Other reasons for disturbance or loss of bat roosts include the use of caves and mines for recreation; the deliberate destruction, defacing or damage of caves or mines; roost deterioration (including both buildings or mines); short or long-term impacts from fire; and mine closures for safety purposes. The presence of alternate roost sites may be critical when this type of disturbance occurs.

Threats to lesser long-nosed bat forage habitat include excess harvesting of agaves in Mexico; collection and destruction of cacti in the U.S.; conversion of habitat for agricultural and livestock uses; the introduction of bufflegrass and other invasive species that can carry fire in Sonoran Desert scrub; wood-cutting; urban development; fires; and drought and climate change.

Large fires supported by invasive vegetation in 2005 affected some lesser long-nosed bat foraging habitat, though the extent is unknown. For example, the Goldwater, Aux, and Sand Tank Fire Complexes on BMGR-East burned through and around isolated patches of saguaros. Rogers (1985) showed that saguaros are not fire-adapted and suffer a high mortality rate as a result of fire. Therefore, fire can significantly affect forage resources for lesser long-nosed bats in the Sonoran desert. Monitoring of saguaro mortality rates should be done to assess the impacts on potential lesser long-nosed bat foraging habitat. More recently, the summer of 2011 saw huge wildfires burning across Arizona. The Wallow Fire (538,049 acres) set a new state record, burning a larger area than the 2002 Rodeo-Chediski Fire (468,638 acres). The Horseshoe 2 Fire (222,954 acres) burned approximately 70% of the Chiricahua Mountains and became the 4th largest fire in Arizona history. In addition to the Horseshoe 2 Fire, two other large wildfires (Murphy Complex and the Monument Fire) and numerous smaller fires burned a total of 366,679 acres in the Coronado National Forest. The Horseshoe 2, Monument, and Murphy fires affected lesser long-nosed bat forage and roost resources throughout those mountain ranges. Fire suppression activities associated with wildfires could also affect foraging habitat. For example, slurry drops can leave residue on saguaro flowers, which could impact lesser long-nosed bat feeding efficiency or result in minor contamination.

Drought may affect lesser long-nosed bat foraging habitat, though the effects of drought on bats are not well understood. The drought in 2004 resulted in near complete flower failure in saguaros throughout the range of lesser long-nosed bats. During that time however, in lieu of saguaro flowers, lesser long-nosed bats foraged heavily on desert agave (*Agave deserti*) flowers, an agave species used less consistently by lesser long-nosed bats (Tibbitts 2006). Similarly, there was a failure of the agave bloom in southeastern Arizona in 2006, probably related to the ongoing drought. As a result, lesser long-nosed bats left some roosts earlier than normal and increased use of hummingbird feeders by lesser long-nosed bats was observed in the Tucson area (personal communication with Scott Richardson, FWS, January 11, 2008). Climate change impacts to the lesser long-nosed bats in this portion of its range likely include loss of forage resources. Of particular concern is the prediction that saguaros, the primary lesser long-nosed bat forage resource in the Sonoran Desert, will decrease or even disappear within the current extent of the Sonoran Desert as climate change progresses (Weiss and Overpeck 2005, p. 2074). Monitoring bats and their forage during drought years is needed to better understand the effects of drought on this species.

The lesser long-nosed bat recovery plan (U.S. Fish and Wildlife Service 1997) identifies the need to protect roost habitats and foraging areas and food plants, such as columnar cacti and agaves. The lesser long-nosed bat recovery plan provides specific discussion and guidance for management and information needs regarding bat roosts and forage resources (U.S. Fish and Wildlife Service 1997). More information regarding the average size of foraging areas around roosts would be helpful to identify the minimum area around roosts that should be protected to maintain adequate forage resources.

We have produced numerous BOs on the lesser long-nosed bat since it was listed as endangered in 1988, some of which anticipated incidental take. Incidental take has been in the form of direct mortality and injury, harm, and harassment and has typically been only for a small number of individuals. Because incidental take of individual bats is difficult to detect, incidental take has often been quantified in terms of loss of forage resources, decreases in numbers of bats at roost sites, or increases in proposed action activities.

Examples of more recent BOs that anticipated incidental take for lesser long-nosed bats are summarized below. The 2013 BO for the Rosemont Copper Mine anticipated take of up to (1) 6,000 individuals harassed at three post-maternity roosts; (2) ten individuals harmed at known lesser long-nosed bat roosts subject to the implementation of protective measures; and (3) 5,401 acres of affected habitat lost containing Palmer's agave, a surrogate measure of take (via harm and harassment) of individuals. The 2010 BO related to the National Park Service's abandoned mine closure program, anticipated the direct take of up to 115 lesser long-nosed bats as a result of collisions with mine closure structures, and the abandonment of one roost site due to mine closure activities. The 2009 and 2008 BOs for implementation of the SBI*net* Ajo 1 and Tucson West Projects, including the installation, operation, and maintenance of communication and sensor towers and other associated infrastructure, each included incidental take in the form of 10 bats caused by collisions with towers and wind turbine blade-strike mortality for the life (presumed indefinite) of the proposed action. The 2007 BO for the installation of one 600 kilowatt wind turbine and one 50KW mass megawatts wind machine on Fort Huachuca included incidental take in the form of 10 bats caused by blade-strikes for the life (presumed indefinite) of the proposed action (U.S. Fish and Wildlife Service 2007c). The 2005 BO for implementation of the Coronado National Forest Land and Resource Management Plan (U.S. Forest Service) included incidental take in the form of harm or harassment. The amount of take for individual bats was not quantified; instead take was to be considered exceeded if simultaneous August counts (at transitory roosts in Arizona, New Mexico, and Sonora) drop below 66,923 lesser long-nosed bats (the lowest number from 2001 – 2004 counts) for a period of two consecutive years as a result of the action. The 2004 BO for the Bureau of Land Management Arizona Statewide Land Use Plan Amendment for Fire, Fuels, and Air Quality Management included incidental take in the form of harassment. The amount of incidental take was quantified in terms of loss of foraging resources, rather than loss of individual bats. The 2003 BO for MCAS–Yuma Activities on the BMGR included incidental take in the form of direct mortality or injury (five bats every 10 years). Because take could not be monitored directly, it was to be considered exceeded if nocturnal low-level helicopter flights in certain areas on the BMGR increased significantly or if the numbers of bats in the Agua Dulce or Bluebird Mine roosts decreased significantly and MCAS-Yuma activities were an important cause of the decline. The 2007 BO for Department of the Army Activities at and near Fort Huachuca (Fort), Arizona anticipated incidental take in the form of

direct mortality or injury (six bats over the life of the project), harassment (20 bats per year), and harm (10 bats over the life of the project) (U.S. Fish and Wildlife Service 2007a).

The lesser long-nosed bat recovery plan (U.S. Fish and Wildlife Service 1997), listing document (53 FR 38456), and the 5-year review summary and evaluation for the lesser long-nosed bat (U.S. Fish and Wildlife Service 2007b), all discuss the status of the species, and threats, and are incorporated by reference.

Mexican Long-nosed Bat

The Mexican long-nosed bat was listed as endangered under the ESA on September 30, 1988 (53 FR 38456). A Recovery Plan was completed in September 1994 (USFWS 1994), and notice of a pending 5-year review was given by the USFWS in February of 2009 (USFWS 2009). There is no designated critical habitat for the species.

Distribution

The Mexican long-nosed bat is primarily a Mexican species, ranging as far south as central Guatemala, but occurs in the United States during the summer months in mountains of the Trans-Pecos area of Texas along the Rio Grande (Barbour and Davis 1969; Schmidly 1991), and in southern Hidalgo County, New Mexico. The first confirmed day-roost site in the United States was a maternity roost in Big Bend National Park (BBNP) (Easterla 1972). Mexican long-nosed bats were also captured in mist nets in southern Hidalgo County, leading to the discovery of two roost sites shared with lesser long-nosed bats (Bogan *et al.* 2006; Cryan 2007). Both sites are caves in the Animas and Big Hatchet mountains. There are additional netting records from the Chinati Mountains of Presidio County, Texas, and Guadalupe Canyon in the southern Peloncillo Mountains of New Mexico (Hoyt *et al.* 1994; Arita and Humphrey 1988).

A single Mexican long-nosed bat was captured in a mist n*et al*ong the Gila River near the Grant-Hidalgo county line in New Mexico, well outside the previously known range of the species (M. Ramsey, personal communication). Juvenile Mexican long-nosed bats have been documented to make wide-ranging, apparently exploratory flights outside of their normal foraging range (England 2012). However, no additional information is available to indicate whether this record represents juvenile dispersal, a vagrant adult, or a roost site that may be previously unknown, intermittently used, or recently colonized. Known lesser long-nosed bat roosts are present in the Peloncillo Mountains, approximately 30 to 40 miles from this capture record, indicating the possible presence of a Mexican long-nosed bat roost because these species are known to roost together in New Mexico.

Habitat and Life History

The Mexican long-nosed bat is a colonial, cave-roosting species. These bats appear to prefer montane habitats, mostly at or above the transition from lowland forests to pine-oak (Barbour and Davis 1969; Schmidly 1991). Mexican long-nosed bats broadly overlap with the range of the lesser long-nosed bat, but Mexican long-nosed bats prefer higher and cooler elevations (Arita 1991). They feed on nectar and pollen, generally using species of *Agave* as their primary food

source while in the United States (Barbour and Davis 1969; Schmidly 1991). Palmer's century plant is the primary food source for the species in New Mexico, and Havard's century plant (*A. havardiana*) is the primary food source in Texas (England 2012).
Estimates of the numbers of bats at the BBNP cave site have varied from more than 13,000 to complete absence in some years. The roost sites in New Mexico have not been entered for censuses, although exit counts combining both species have exceeded 7,000 individuals. Lesser long-nosed bats appear to outnumber Mexican long-nosed bats in New Mexico roosts, based on mist-netting results, although behavioral differences may have influenced relative capture success for both species (Bogan *et al.* 2006).

The presence of this species in the United States at the northern edge of its range may reflect fluctuation of the core population in Mexico from year to year, or dispersal due to a lack of food resources within the core range (Schmidly 1991). While the bats typically roost at higher elevations, they may visit lower elevations while foraging, as evidenced by a netting record along the Rio Grande (Barbour and Davis 1969).

Threats to the Survival of the Mexican long-nosed bat

A primary threat to the species is disturbance or killing of bats in roosts (USFWS 1994). Loss of food resources from conversion of land for agriculture or agave harvesting in Mexico could adversely affect the species (Moreno-Valdez *et al.* 2004).

Previous consultations for the Mexican long-nosed bat include the October 24, 2002 consultation AESO/SE 2-21-98-F-399-R1, Reinitiation of Biological Opinion 2-21-98-F-399; Continuation of Livestock Grazing on the Coronado National Forest (Arizona), the May 14, 2008 consultation 22410-2008-F-0053 reinitiating consultation on several allotment on the Douglas Ranger District, Coronado National Forest, and the November 13, 2013 consultation 02EAAZ00-2013-F-0168 for the SunZia Southwest Transmission Line Project.

Pima Pineapple Cactus

The Pima Pineapple cactus was listed as an endangered species without critical habitat on September 23, 1993 (58 FR 49875). Factors that contributed to the listing include habitat loss and degradation, habitat modification and fragmentation, limited geographical distribution and species rareness, illegal collection, and difficulties in protecting areas large enough to maintain functioning populations. In 2005, a 5-year review was initiated for the Pima Pineapple cactus (70 FR 5460). This review was completed in 2007 and recommended no change to the cactus's classification as an endangered species (U.S. Fish and Wildlife Service 2007).

Recent investigations of taxonomy and geographical distribution focused, in part, on assessing the validity of the taxon (see Baker 2004, Baker 2005, and Schmalzel *et al.* 2004). Although there is evidence for a general pattern of clinal variation across the range of the species (Schmalzel *et al.* 2004), this does not preclude the recognition of taxonomic varieties within *C. sheeri* (= *C. robustispina*). Baker (2005) found that there are distinct geographical gaps between the distribution of this subspecies and the other subspecies, which occur in eastern Arizona, New Mexico, and Texas, and that the subspecies are morphologically coherent within

their respective taxa (Baker 2004). His geographical and morphological work supports the idea that the sub-specific groups within *C. robustispina* are indeed discrete, and merit separate taxonomic status as subspecies (U.S. Fish and Wildlife Service 2007).

We have determined that Pima Pineapple cactus that are too isolated from each other may not be effectively pollinated. For example, the major pollinator of Pima Pineapple cactus is thought to be *Diadasia rinconis*, a ground-nesting, solitary, native bee. McDonald (2005) found that Pima Pineapple cactus plants need to be within approximately 600 m (1,969 ft) of each other in order to facilitate effective pollination. Based on this information and other information related to similar cacti and pollinators, we have determined that Pima Pineapple cactus plants that are located at distances greater than 900 meters from one another become isolated with regard to meeting their life history requirements. The species is an obligate outcrosser (not self-pollinating), so it is important for plants to be within a certain distance to exchange pollen with each other. Also, the study found that pollination was more effective when other species of native cacti are near areas that support Pima Pineapple cactus. The native bees pollinate a variety of cacti species and the sole presence of Pima Pineapple cactus may not be enough to attract pollinators.

The Pima Pineapple cactus occurs south of Tucson, in Pima and Santa Cruz counties, Arizona, as well as in adjacent northern Sonora, Mexico. In Arizona, it is distributed at very low densities throughout both the Altar and Santa Cruz valleys, and in low-lying areas connecting the two valleys. This cactus generally grows on slopes of less than 10 percent and along the tops (upland areas) of alluvial bajadas. The plant is found at elevations between 2,360 feet (ft) and 4,700 ft (Phillips *et al.* 1981, Benson 1982, Ecosphere Environmental Services Inc. 1992), in vegetation characterized as either or a combination of Arizona upland of the Sonoran desertscrub community and semi-desert grasslands (Brown 1982, Johnson 2004). Paredes-Aguilar *et al.* (2000) reports the subspecies from oak woodlands in Sonora. Several attempts have been made to delineate habitat within the range of Pima Pineapple cactus (McPherson 2002, RECON Environmental Inc. 2006, U.S. Fish and Wildlife Service unpublished analysis) with limited success. As such, we are still unable to determine exact ecological characters to help us predict locations of Pima Pineapple cactus or precisely delineate Pima Pineapple cactus habitat (U.S. Fish and Wildlife Service 2007), except perhaps in localized areas (U.S. Fish and Wildlife Service 2005).

As a consequence of its general habitat requirements, considerable habitat for this species appears to exist in Pima and Santa Cruz counties, much of which is unoccupied. Pima Pineapple cactus occurs at low densities, widely scattered, sometimes in clumps, across the valley bottoms and bajadas. The species can be difficult to detect, especially in dense grass cover. For this reason, systematic surveys are expensive and have not been conducted extensively throughout the range of the Pima Pineapple cactus. As a result, location information has been gathered opportunistically, either through small systematic surveys, usually associated with specific development projects, or larger surveys that are typically only conducted in areas that seem highly suited for the species. Furthermore, our knowledge of the distribution and status of this species is gathered primarily through the section 7 process; and we only see projects that require a Federal permit or have Federal funding. There are many projects that occur within the range of Pima Pineapple cactus that do not undergo section 7 consultation, and we have no information

regarding the status or loss of plants or habitat associated with those projects. For these reasons, it is difficult to address abundance and population trends for this species.

The AGFD maintains the Heritage Data Management System (HDMS), a database identifying elements of concern in Arizona and consolidating information about their distribution and status throughout the state. This database has 5,553 Pima Pineapple cactus records, with 5,449 Pima Pineapple cactus that have coordinates. Some of the records are quite old, and we have not confirmed whether the plants are still alive. We also cannot determine which plants may be the result of multiple surveys in a given area. Of the known individuals (5,553), approximately 1,340 Pima Pineapple cactus plants are documented in the database as extirpated as of 2003. There have been additional losses since 2003, but that information is still being compiled in the database. The database is dynamic, based on periodic entry of new information, as time and staffing allows. As such, the numbers used from one biological opinion to the next may vary and should be viewed as a snapshot in time at any given moment. We have not tracked loss of habitat because a limited number of biological assessments actually quantify habitat for Pima Pineapple cactus.

We do know the number and fate of PPC that have been detected during surveys for projects that have undergone section 7 consultation. Through 2014, section 7 consultations on development projects (e.g., residential and commercial development, mining, infrastructure improvement) considered 2,939 PPC plants found on approximately 15,771 acres within the range of the PPC. Of the total number of plants, 2,170 PPC (74 percent) were destroyed, removed, or transplanted as a result of development, mining, and infrastructure projects. In terms of PPC habitat, some of the 15,771 acres likely did not provide PPC habitat, but that amount is difficult to quantify because PPC habitat was not consistently delineated in every consultation. Of the 15,771 acres, however, we are aware that 15,106 acres (96 percent) have been either permanently or temporarily impacted. Some of these acres may still provide natural open space, but we have not been informed of any measures (e.g., conservation easements) that have been completed to ensure these areas will remain open. Through section 7 consultation on non-development-related projects (e.g., fire management plans, grazing, buffelgrass control), we are aware of an additional 781 plants within an unknown number of acres; we do not know the number of acres because these types of projects are often surveyed for PPC inconsistently, if at all. Across the entire PPC range, it is difficult to quantify the total number of PPC lost and the rate and amount of habitat loss for three reasons: 1) we review only a small portion of projects within the range of PPC (only those that have Federal involvement and are subject to section 7 consultation), 2) development that takes place without any jurisdictional oversight is not tracked within Pima and Santa Cruz counties, and 3) many areas within the range of the PPC have not been surveyed; therefore, we do not know how many plants exist or how much habitat is presently available.

Some additional information related to the survival of Pima Pineapple cactus comes from six demographic plots that were established in 2002 in the Altar Valley. The results from the first year (2002-2003) indicate that the populations were stable; out of a total of over 300 Pima Pineapple cactus measured, only 10 died, and two Pima Pineapple cactus seedlings were found (Routson *et al.* 2004). The plots were not monitored in 2004, but were visited again starting in May 2005. In the two years between September 2003 and September 2005, 35 individuals, or 13.4 percent, of the original population had died and no new seedlings were found (Baker

2006a). Baker (2006a) suggests that recruitment likely occurs in punctuated events in response to quality and timing of precipitation, and possibly temperature, but there is little evidence until such events occur. He goes on to say that further observations need to be made to determine the rate at which the population is declining, because, based on an overall rate of die-off of 13.4 percent every two years, few individuals will be alive at this site after 15 years. As this monitoring program continues, critical questions regarding the life cycle of this species will be answered.

Threats to Pima Pineapple cactus continue to include habitat loss and fragmentation, competition with non-native species, and inadequate regulatory mechanisms to protect this species. We believe residential and commercial development, and its infrastructure, is by far the greatest threat to Pima Pineapple cactus and its habitat. However, we have only a limited ability to track the cumulative amount of development within the range of Pima Pineapple cactus. What is known with certainty is that development pressure continues in Pima and Santa Cruz counties.

Invasive grass species may be a threat to the habitat of Pima Pineapple cactus. Habitat in the southern portion of the Altar Valley is now dominated by Lehmann lovegrass (*Eragrostis lehmanniana*). According to Gori and Enquist (2003), Boer lovegrass (*Eragrostis chloromelas*) and Lehmann lovegrass are now common and dominant on 1,470,000 acres in southeastern Arizona. They believe that these two grass species will continue to invade native grasslands to the north and east, as well as south into Mexico. These grasses have a completely different fire regime than the native grasses, tending to form dense stands that promote higher intensity fires more frequently. Disturbance (like fire) tends to promote the spread of these non-natives (Ruyle *et al.* 1988, Anable *et al.* 1992). Roller and Halvorson (1997) hypothesized that fire-induced mortality of Pima Pineapple cactus increases with Lehmann lovegrass density. Buffelgrass (*Pennisetum ciliare*) has become locally dominant in vacant areas in the City of Tucson and along roadsides, notably in the rights-of-way along Interstate 10 and State Route 86. Some portions of Pima Pineapple cactus habitat along these major roadways are already being converted to dense stands of buffelgrass, which can lead to recurring grassland fires and the destruction of native desert vegetation (Buffelgrass Working Group 2007).

The effects of climate change (i.e., decreased precipitation and water resources) are a threat to the long-term survival and distribution of native plant species, including the Pima Pineapple cactus. For example, temperatures rose in the twentieth century and warming is predicted to continue over the twenty-first century. Although climate models are less certain about predicted trends in precipitation, the southwestern United States is expected to become warmer and drier. In addition, precipitation is expected to decrease in the southwestern United States, and many semi-arid regions will suffer a decrease in water resources from climate change as a result of less annual mean precipitation and reduced length of snow season and snow depth. Approximately half of the precipitation within the range of the Pima Pineapple cactus typically falls in the summer months; however, the impacts of climate change on summer precipitation are not well understood. Drought conditions in the southwestern United States have increased over time and may have contributed to loss of Pima Pineapple cactus populations through heat stress, drought stress, and related insect attack, as well as a reduction in germination and seedling success since the species was originally listed in 1993, and possibly historically. Climate change trends are

likely to continue, and the impacts on species will likely be complicated by interactions with other factors (e.g., interactions with non-native species and other habitat-disturbing activities).

The Arizona Native Plant Law can delay vegetation clearing on private property for the salvage of specific plant species within a 30-day period. Although the Arizona Native Plant Law prohibits the taking of this species on State and private lands without a permit for educational or research purposes, it does not provide for protection of plants *in situ* through restrictions on development activities. Even if Pima Pineapple cactus are salvaged from a site, transplanted individuals only contribute to a population if they survive and are close enough (within 900 m [(2,970 ft]) to other Pima Pineapple cactus to be part of a breeding population from the perspective of pollinator travel distances and the likelihood of effective pollination. Transplanted Pima Pineapple cactus have variable survival rates, with moderate to low levels of survival documented. Past efforts to transplant individual Pima Pineapple cactus to other locations have had limited success. For example, on two separate projects in Green Valley, the mortality rate for transplanted Pima Pineapple cactus after two years was 24 percent and 66 percent, respectively (SWCA, Inc. 2001, WestLand Resources, Inc. 2004). One project southwest of Corona de Tucson involved transplanting Pima Pineapple cactus into areas containing *in situ* plants. Over the course of three years, 48 percent of the transplanted individuals and 24 percent of the *in situ* individuals died (WestLand Resources, Inc. 2008). There is also the unquantifiable loss of the existing Pima Pineapple cactus seed bank associated with the loss of suitable habitat. Furthermore, once individuals are transplanted from a site, Pima Pineapple cactus is considered to be extirpated from that site, as those individuals functioning in that habitat are moved elsewhere. There are currently two ongoing research projects related to the relocation of Pima Pineapple cacti which should give us additional information related to the effectiveness of this potential conservation strategy.

Pima County regulates the loss of native plant material associated with ground-disturbing activities through their Native Plant Protection Ordinance (NPPO) (Pima County 1998). The NPPO requires inventory of the site and protection and mitigation of certain plant species slated for destruction by the following method: the designation of a minimum of 30 percent of on-site, permanently protected open space with preservation in place or transplanting of certain native plant species from the site. There are various tables that determine the mitigation ratio for different native plant species (e.g. saguaros, ironwood trees, Pima Pineapple cactus) with the result that mitigation may occur at a 1:1 or 2:1 replacement ratio. Mitigation requirements are met through the development of preservation plans. The inadvertent consequence of this ordinance is that it has created a "market" for Pima Pineapple cactus. Any developer who cannot avoid this species or move it to another protected area must replace it. Most local nurseries do not grow Pima Pineapple cactus (and cannot grow them legally unless seed was collected before the listing). As a result, environmental consultants are collecting Pima Pineapple cactus seed from existing sites (which can be done with a permit from the Arizona Department of Agriculture and the permission of the private landowner), germinating seed, and placing Pima Pineapple cactus plants grown from seed back on these sites. There have been no long-term studies of transplant projects, thus the conservation benefit of these actions is unknown. Moreover, growing and planting Pima Pineapple cactus does not address the loss of Pima Pineapple cactus habitat that necessitated the action of transplanting cacti in the first place.

Other specific threats that have been previously documented (58 FR 49875), such as overgrazing, illegal collection, prescribed fire, and mining, have not yet been analyzed to determine the extent of effects to this species. However, partial information exists. Overgrazing by livestock, illegal collection, and fire-related interactions involving exotic Lehmann lovegrass and buffelgrass may negatively affect Pima Pineapple cactus populations. Mining has resulted in the loss of hundreds, if not thousands, of acres of potential habitat throughout the range of the plant.

The protection of Pima Pineapple cactus habitat and individuals is complicated by the varying land ownership within the range of this species in Arizona. An estimated 10 percent of the potential habitat for Pima Pineapple cactus is held in Federal ownership. The remaining 90 percent is on Tribal, State, and private lands. Most of the federally-owned land is either at the edge of the plant's range or in scattered parcels. The largest contiguous parcel of federally-owned habitat is the Buenos Aires National Wildlife Refuge, located at the southwestern edge of the plant's range at higher elevations and with lower plant densities. No significant populations of Pima Pineapple cactus are known from Sonora or elsewhere in Mexico (Baker 2005).

There have been some notable conservation developments for this species. As of 2010, there are two conservation banks for Pima Pineapple cactus, one on a private ranch in the Altar Valley (Palo Alto Ranch Conservation Bank) and another owned by Pima County that includes areas in both the Altar Valley and south of Green Valley. In the Palo Alto Ranch Conservation Bank, 131.6 acres have been conserved to date. In Pima County's Bank, a total of 530 acres are under a conservation easement at this time (the County offsets its own projects within this bank). Additionally, three large blocks of land totaling another 1,078 acres have been set aside or are under conservation easements through previous section 7 consultations (see consultations 02-21-99-F-273, 02-21-01-F-101, and 02-21-03-F-0406). While not formal conservation banks, these areas, currently totaling 1,739.6 acres, are set aside and managed specifically for Pima Pineapple cactus as large blocks of land, and likely contribute to recovery of the taxon for this reason; therefore, we consider these acres conserved. Another 647 acres of land have been set aside as natural open space within the developments reviewed through section 7 consultation between 1995 and 2010. However, these are often small areas within residential backyards (not in a common area) that are difficult to manage and usually isolated within the larger development, and often include areas that do not provide Pima Pineapple cactus habitat (e.g., washes). Some conservation may occur onsite because of these open space designations, but long-term data on conservation within developed areas are lacking; the value of these areas to Pima Pineapple cactus recovery over the long-term is likely not great.

In summary, Pima Pineapple cactus conservation efforts are currently hampered by a lack of information on the species. Specifically, we have not been able to determine exact ecological characters to help us predict locations of Pima Pineapple cactus or precisely delineate its habitat, and considerable area within the Pima Pineapple cactus range has not been surveyed. Further, there are still significant gaps in our knowledge of the life history of Pima Pineapple cactus; for instance, we have yet to observe a good year for seed germination. From researcher observations and motion sensing cameras, we have learned that ants, Harris' antelope squirrels, and jackrabbits act as seed dispersal agents. Demographic plots have been only recently established,

and information is just now beginning to be reported with regard to describing population dynamics for Pima Pineapple cactus in the Altar Valley.

Development and associated loss of habitat remain important and continuing threats to this taxon. However, the expanding threat of non-native grasses and resulting altered fire regimes are a serious concern for the long-term viability of the species, as is ongoing drought. The full impact of drought and climate change on Pima Pineapple cactus has yet to be studied, but it is likely that, if recruitment occurs in punctuated events based on precipitation and temperature (Baker 2006a), Pima Pineapple cactus will be negatively affected by these forces. Already we have seen a nearly 25% loss of individuals across six study sites in the Altar Valley between 2010 and 2011; these deaths were attributed largely to drought and associated predation by native insects and rodents (Baker 2011). Conservation efforts that focus on habitat acquisition and protection, like those proposed by Pima County and the City of Tucson, are important steps in securing the long-term viability of this taxon. Regulatory mechanisms, such as the native plant protection ordinances, provide conservation direction for Pima Pineapple cactus habitat protection within subdivisions, and may serve to reduce Pima Pineapple cactus habitat fragmentation within areas of projected urban growth.

Southwestern Willow Flycatcher

The flycatcher was listed as endangered, without critical habitat on February 27, 1995 (60 FR 10694). Final designated critical habitat was published on January 3, 2013 ((78 FR 344). The southwestern willow flycatcher recovery plan (U.S. Fish and Wildlife Service 2002) (RP) describes reasons for endangerment, flycatcher status, addresses recovery actions, includes detailed issue papers, and provides recovery goals. Recovery is based on reaching numerical and habitat related goals for each specific Management Unit (MU) established throughout the subspecies' range and establishing long-term conservation plans.

Description

The southwestern willow flycatcher 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 southwestern willow flycatcher included southern California, Arizona, New Mexico, western Texas, southwestern Colorado, southern Utah, extreme southern Nevada, and extreme northwestern Mexico (Sonora and Baja) (Unitt 1987).

Habitat

The southwestern willow flycatcher 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 southwestern willow

flycatcher's widespread use of willow (*Salix* spp.) for nesting (Phillips 1948, Phillips *et al.* 1964, Hubbard 1987, Unitt 1987). Currently, southwestern willow flycatchers primarily use Geyer willow (*S. geyeriana*), coyote willow (*S. exigua*), Goodding's willow (*S. 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 southwestern willow flycatcher: monotypic willow, monotypic exotic, native broadleaf dominated, and mixed native/exotic (Sogge *et al.* 1997). The southwestern willow flycatcher is an insectivore, foraging in dense shrub and tree vegetation along rivers, streams, and other wetlands.

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 southwestern willow flycatchers (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 a tamarisk tree (Smith *et al.* 2002). Tamarisk had been believed by some to be a habitat type of lesser quality for the southwestern willow flycatcher, however comparisons of reproductive performance (U. S. Fish and Wildlife Service 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 southwestern willow flycatcher 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. 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.

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 two large populations (Roosevelt Lake and San Pedro/Gila River confluence). 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.

Factors Affecting the Species

The evidence suggests that fire was not a primary disturbance factor in southwestern riparian areas near larger streams (U. S. Fish and Wildlife Service 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 fire in June 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 (U. S. Fish and Wildlife Service 2002).

There are no extensive records for the actual causes of adult southwestern willow flycatcher mortality. Incidents associated with nest failures, human disturbance, and nestlings are typically the most often recorded due to the static location of nestlings, eggs, and nests. As a result, nestling predation and brood parasitism are the most commonly recorded causes of southwestern willow flycatcher mortality. Also, human destruction of nesting habitat through bulldozing, groundwater pumping, and aerial defoliants has been recorded in Arizona (T. McCarthey, AGFD, pers. comm.). Human collision with nests and spilling the eggs or young onto the ground have been documented near high use recreational areas (U. S. Fish and Wildlife Service 2002). A southwestern willow flycatcher from the Greer Town site along the Little Colorado River in eastern Arizona was found dead after being hit by a vehicle along SR 373. This route is adjacent to the breeding site (T. McCarthey, AGFD, pers. comm.).

Since listing in 1995, approximately 210 Federal agency actions have undergone (or are currently under) formal section 7 consultation throughout the flycatcher's range. This list of consultations 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 under the more recent designation.

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 southwestern willow flycatcher. 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, Arizona, 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.

Critical Habitat

Critical habitat has been designated along approximately 1,975 stream kilometers (1,227 stream miles). The designation includes the 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 84,569 hectares (208,973 acres). Critical habitat units have been designated in areas within California, Arizona, and New Mexico. Within these areas, the primary constituent elements of the physical and biological features essential to the conservation of the southwestern willow flycatcher are:

1. *Riparian vegetation.* Riparian habitat along a dynamic river or lakeside, in a natural or manmade successional environment (for nesting, foraging, migration, dispersal, and shelter) that is comprised of trees and shrubs (that can include 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 2 meters (m) to 30 m (about 6 feet (ft) to 98 ft). Lower stature thickets (2 to 4 m or 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 4 m (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 0.1 hectare (ha) (0.25 acre (ac)) or as large as 70 ha (175 ac).

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).

A complete description of the biology of the southwestern willow flycatcher (*Empidonax traillii extimus*) is contained in the *Southwestern Willow Flycatcher Recovery Plan* U. S. Fish and Wildlife Service 2002).

Northern Mexican Gartersnake

The northern Mexican gartersnake was listed as threatened under the Act on July 8, 2014 (79 FR 38678). Critical habitat was proposed on July 10, 2013 (78 FR 41550), with a final determination in preparation. Refer to these two rules for more in-depth information on the ecology and threats to the species, including references. The proposed rules are incorporated here by reference.

Description

The northern Mexican gartersnake ranges in color from olive to olive-brown or olive-gray with three lighter-colored stripes that run the length of the body, the middle of which darkens towards the tail. It may occur with other native gartersnake species and can be difficult for people without specific expertise to identify. The snake may reach a maximum length of 44 in (112 cm). The pale yellow to light-tan lateral stripes distinguish the northern Mexican gartersnake from sympatric gartersnake species because a portion of the lateral stripe is found on the fourth scale row, while it is confined to lower scale rows for other species. Paired black spots extend along the olive dorsolateral fields (region adjacent to the top of the snake's back) and the olive-gray ventrolateral fields. The scales are keeled.

Habitat and Natural History

Throughout its rangewide distribution, the northern Mexican gartersnake occurs at elevations from 130 to 8,497 feet (40 to 2,590 meters) (Rossman *et al.* 1996) and is considered a "terrestrial-aquatic generalist" by Drummond and Marcías-García (1983). The northern Mexican gartersnake is a riparian obligate (generally found near water when not dispersing) and occurs chiefly in the following habitat types: 1) Source-area wetlands (e.g., cienegas [mid-elevation wetlands with highly organic, reducing {basic or alkaline} soils], or stock tanks); 2) large-river

riparian woodlands and forests; and 3) streamside gallery forests (as defined by well-developed broadleaf deciduous riparian forests with limited, if any, herbaceous ground cover or dense grass) (Hendrickson and Minckley 1984, Rosen and Schwalbe 1988). When surveying in the upper Verde River region, Emmons and Nowak (2013) found this subspecies most commonly in protected backwaters, braided side channels and beaver ponds, isolated pools near the river mainstem, and edges of dense emergent vegetation that offered cover and foraging opportunities.

The northern Mexican gartersnake is surface active at ambient (air) temperatures ranging from 71 degrees Fahrenheit (°F) to 91 °F (22 degrees Celsius (°C) to 33 °C) and forages along the banks of waterbodies (Rosen 1991, p. 305, Table 2). While conducting visual surveys, Rosen (1991, pp. 308–309) found that northern Mexican gartersnakes spent up to 60 percent of their time moving, 13 percent of their time basking on vegetation, 18 percent of their time basking on the ground, and 9 percent of their time under surface cover. However, preliminary telemetry data from a population of northern Mexican gartersnakes at the Bubbling Ponds State Fish Hatchery show individuals were surface active during 16 percent of telemetry observations, not surface active during 64 percent of telemetry observations, and surface activity was undetermined for 20 percent of the telemetry observations (Boyarsky 2013, pers. comm.); at Tavasci Marsh along the upper Verde River, they were inactive 60 percent of the time (Emmons 2013b, pers. comm.). In the northern-most part of its range, the northern Mexican gartersnake appears to be most active during July and August, followed by June and September (Emmons and Nowak 2013, p. 14). Northern Mexican gartersnakes may use different sites as hibernacula during a single cold-season and will bask occasionally (Emmons 2014, pers. comm.).

The northern Mexican gartersnake is an active predator and is believed to heavily depend upon a native prey base (Rosen and Schwalbe 1988). Northern Mexican gartersnakes forage along vegetated banklines, searching for prey in water and on land, using different strategies (Alfaro 2002). Generally, its diet consists of amphibians and fishes, such as adult and larval (tadpoles) native leopard frogs (e.g., lowland leopard frog [*Lithobates yavapaiensis*] and Chiricahua leopard frog), as well as juvenile and adult native fish species (e.g., Gila topminnow, desert pupfish, and roundtail chub [*G. robusta*]) (Rosen and Schwalbe 1988). Drummond and Marcías-García (1983) found that as a subspecies, Mexican gartersnakes fed primarily on frogs. Auxiliary prey items may also include young Woodhouse's toads (*Anaxyrus woodhousei*), treefrogs (Family Hylidae), earthworms, deermice (*Peromyscus* spp.), lizards of the genera Aspidoscelis and Sceloporus, larval tiger salamanders (*Ambystoma tigrinum*), and leeches (Gregory *et al.* 1980, Holm and Lowe 1995, Degenhardt *et al.* 1996, Rossman *et al.* 1996, Manjarrez 1998). In situations where native prey species are rare or absent, this snake's diet may include nonnative species, including larval and juvenile bullfrogs (*Lithobates catesbeianus*), western mosquitofish (*Gambusia affinis*) (Holycross *et al.* 2006, Emmons and Nowak 2013), or other soft-rayed fishes. Venegas-Barrera and Manjarrez (2001) reported the first observation of a snake in the natural diet of any species of Thamnophis after documenting the consumption by a Mexican gartersnake (subspecies not provided) of a Mexican alpine blotched gartersnake (*T. scalaris*).

Historical Distribution

Within the United States, the northern Mexican gartersnake historically occurred predominantly in Arizona at elevations ranging from 130 to 6,150 ft (40-1,875 m). It was generally found where water was relatively permanent and supported suitable habitat. The northern Mexican gartersnake historically occurred in every county and nearly every subbasin within Arizona, from several perennial or intermittent creeks, streams, and rivers as well as lentic (still, non-flowing water) wetlands such as cienegas, ponds, or stock tanks. Northern Mexican gartersnake records exist within the following subbasins in Arizona: Colorado River, Bill Williams River, Agua Fria River, Salt River, Tonto Creek, Verde River, Santa Cruz River, Cienega Creek, San Pedro River, Babocomari River, and the Rio San Bernardino (Black Draw) (Woodin 1950, Nickerson and Mays 1970, Bradley 1986, Brennan and Holycross 2006, Cotton *et al.* 2013).

Historically, the northern Mexican gartersnake had a limited distribution in New Mexico that consisted of scattered locations throughout the Upper Gila River watershed in Grant and western Hidalgo Counties, including the Upper Gila River, Mule Creek in the San Francisco River subbasin, and the Mimbres River (Price 1980, Fitzgerald 1986, Degenhardt *et al.* 1996, Holycross *et al.* 2006).

Current Distribution and Population Status

The only viable northern Mexican gartersnake populations in the United States where the subspecies remains reliably detected are all in Arizona: 1) The Page Springs and Bubbling Ponds State Fish Hatcheries along Oak Creek, 2) lower Tonto Creek, 3) the upper Santa Cruz River in the San Rafael Valley, 4) the Bill Williams River, and 5) the upper/middle Verde River. In New Mexico, the northern Mexican gartersnake may occur in extremely low population densities within its historical distribution; limited survey effort is inconclusive with respect to determining extirpation. The status of the northern Mexican gartersnake on tribal lands, such as those owned by the White Mountain or San Carlos Apache Tribes, is poorly known due to historically limited survey access and access to any survey data. As stated previously, less is known specifically about the current distribution of the northern Mexican gartersnake in Mexico due to limited surveys and limited access to information on survey efforts and field data from Mexico. All proposed critical habitat units (see critical habitat section below) are considered occupied (78 FR 41558).

Threats to the Northern Mexican Gartersnake

Riparian and aquatic communities in both the United States and Mexico have been significantly impacted by a shift in species' composition, from one of primarily native fauna, to one being increasingly dominated by an expanding assemblage of nonnative animal species. These nonnative species have been intentionally or accidentally introduced, including crayfish, bullfrogs, and nonnative, spiny-rayed fish. Harmful nonnative species have been introduced or have spread into new areas through a variety of mechanisms, by sport stocking, aquaculture, aquarium releases, and bait-bucket release. The overall effect of these harmful nonnative species on gartersnake populations is two-fold. Harmful nonnative species contribute to starvation of gartersnake populations through competitive mechanisms, and reduce or eliminate

recruitment of young gartersnakes through predation. The threat from harmful nonnative species is the most severe and geographically pervasive of all threats affecting the northern Mexican gartersnake.

The occurrence of harmful nonnative species, such as the bullfrog, the northern (virile) crayfish (*Orconectes virilis*), red swamp crayfish (*Procambarus clarkii*), and numerous species of nonnative, spiny-rayed fish (often referred to as "warm water sportfish"), has contributed to rangewide declines in the northern Mexican gartersnake, and continues to be the most significant threat to the species and to its prey base, as a result of direct predation, competition, and modification of habitat as evidenced in a broad body of literature, the most recent of which extends from 1985 to the present (Papoulias *et al.* 1989, Inman *et al.* 1998, Knapp 2005, Luja and Rodríguez-Estrella 2008, Emmons and Nowak 2013). Tail injuries are also a concern for gartersnake populations that occur with harmful nonnative species (Willis *et al.* 1982, Rosen and Schwalbe1988, Mushinsky and Miller 1993, Fitch 2003) and can affect the majority of individuals within a population (Rosen and Schwalbe1988).

The scientific literature confirms that harmful nonnative species are the most significant and widespread factor that continues to drive further declines in and extirpations of northern Mexican gartersnake populations. Additional threats to their habitat can also contribute to population declines, but should be evaluated in the context of the presence or absence of harmful nonnative species. Researchers agree that the period from 1850 to 1940 marked the greatest loss and degradation of riparian and aquatic communities in Arizona, many of which were caused by anthropogenic (human-caused) land uses and the primary and secondary effects of those uses (Davis 1982, Stromberg *et al.* 1996, Webb and Leake 2005). Degradation of habitats is a well-recognized factor in establishment of nonnative species (Courtenay and Stauffer 1984, Arthington *et al.* 1990, Soule 1990, Aquatic Nuisance Species Task Force 1994).

The presence of water is critical for northern Mexican gartersnakes, as well as their prey base. Of all the activities that may threaten their physical habitat, none are more serious than those that reduce flows or dewater habitat over large reaches or locally. Structures or activities that can cause these effects include dams, diversions, flood-control projects, and groundwater pumping and are widespread in Arizona, largely in response to human population growth. For example, municipal water use in central Arizona increased by 39 percent from 1998 to 2006 (American Rivers 2006), and at least 35 percent of Arizona's perennial rivers have been dewatered, assisted by about 95 dams that are in operation in Arizona today (Turner and List 2007).

Flow regimes within streams are a primary factor that shape fish communities. The timing, duration, intensity, and frequency of flood events has been altered to varying degrees by the presence of dams, which effects fish communities. Specifically, Haney *et al.* (2008) suggested that flood pulses may help to reduce populations of nonnative species (Minckley and Meffe 1987) and efforts to increase baseflows may assist in sustaining native prey species for northern Mexican gartersnakes. However, the investigators in this study also suggest that, because the northern Mexican gartersnake preys on both fish and frogs, it may be less affected by reductions in baseflow of streams (Haney *et al.* 2008). Unregulated flows with elevated discharge events favor native species, and regulated flows, absent significant discharge events, favor nonnative species (Rinne and Miller 2006, Propst *et al.* 2008).

The ecology and natural history of northern Mexican gartersnakes is linked to water. As discussed above, the northern Mexican gartersnake is an aquatic species and relies largely upon other aquatic species, such as ranid frogs and native and nonnative, soft-rayed fish as prey. Therefore, these factors are likely to make northern Mexican gartersnakes vulnerable to effects of climate change and drought.

Many other factors have contributed to the decline of the northern Mexican gartersnake, and in some cases, continue to present a significant threat to low-density populations through synergistic mechanisms. These factors, and their effects to northern Mexican gartersnake populations, were discussed in detail in our 2014 rule to list the subspecies (79 FR 38678) and in the 2013 rule proposing critical habitat (78 FR 41500) which is incorporated by reference here. For more information on these additional threats, please review our rules and references cited.

Proposed Critical Habitat

Critical habitat has been proposed in portions of Arizona and New Mexico totaling 421,423 acres. Within these areas, the primary constituent elements of the physical and biological features essential to the conservation of the northern Mexican gartersnake are:

1. Aquatic or riparian habitat that includes:
    a. Perennial or spatially intermittent streams of low to moderate gradient that possess appropriate amounts of in-channel pools, off-channel pools, or backwater habitat, and that possess a natural, unregulated flow regime that allows for periodic flooding or, if flows are modified or regulated, a flow regime that allows for adequate river functions, such as flows capable of processing sediment loads; or
    b. Lentic wetlands such as livestock tanks, springs, and cienegas; and
    c. Shoreline habitat with adequate organic and inorganic structural complexity to allow for thermoregulation, gestation, shelter, protection from predators, and foraging opportunities (e.g., boulders, rocks, organic debris such as downed trees or logs, debris jams, small mammal burrows, or leaf litter); and
    d. Aquatic habitat with characteristics that support a native amphibian prey base, such as salinities less than 5 parts per thousand, pH greater than or equal to 5.6, and pollutants absent or minimally present at levels that do not affect survival of any age class of the northern Mexican gartersnake or the maintenance of prey populations.
2. Adequate terrestrial space (600 ft [182.9 m] lateral extent to either side of bankfull stage) adjacent to designated stream systems with sufficient structural characteristics to support life-history functions such as gestation, immigration, emigration, and brumation.
3. A prey base consisting of viable populations of native amphibian and native fish species.
4. An absence of nonnative fish species of the families Centrarchidae and Ictaluridae, bullfrogs, and/or crayfish (*O. virilis, P. clarki*, etc.), or occurrence of these nonnative species at low enough levels such that recruitment of northern Mexican gartersnakes and maintenance of viable native fish or soft-rayed, nonnative fish populations (prey) is still occurring.

Yellow-billed Cuckoo, Western Distinct Population Segment

The Western Distinct Population Segment (DPS) of the yellow-billed cuckoo was listed as a threatened species on October 2, 2014 (79 FR 59992). Critical habitat was proposed on August 15, 2014 (79 FR 48548), with a final determination expected sometime in 2015.

Physical Characteristics

Adult yellow-billed cuckoos 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 in (30cm) in length, and about 2 oz (60 g) 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, 79 FR 59992).

Morphologically, the yellow-billed cuckoos throughout the western continental United States and Mexico are generally larger than individuals in the eastern United States, with significantly longer wings, longer tails, and longer and deeper bills (Franzreb and Laymon 1993). Birds with these characteristics occupy the Western DPS and are we refer to them as the "western yellow-billed cuckoo." Only the Western DPS has been proposed for listing as a threatened species (78 FR 61622). Yellow-billed cuckoos 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). Some information exists suggesting that the western population segment described in the scientific literature as the western yellow-billed cuckoo (Coccyzus americanus occidentalis) is distinguishable at the subspecific level; however, there is enough literature to conclude that recognition of the subspecies is not justified at this time (79 FR 59992).

Distribution

The yellow-billed cuckoo 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 (American Ornithologists Union 1957, 1983, 1998).

Based on historical accounts, the western yellow-billed cuckoo 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 (American Ornithologists Union 1998, Hughes 1999). The species may be extirpated from British Colombia, Washington, and Oregon (Hughes 1999). The western yellow-billed cuckoo is now very rare in scattered drainages in western Colorado, Idaho, Nevada, and Utah, with single, nonbreeding birds most likely to occur (66 FR 38611). The largest remaining breeding areas are in southern and central California, Arizona, along the Rio Grande in New Mexico, and in northwestern Mexico U.S. Fish and Wildlife Service 2013).

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 (U.S. Fish and Wildlife Service 2013).

Yellow-billed cuckoos 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, American Ornithologists Union 1998, Johnson *et al.* 2008b). The species as a whole winters in woody vegetation bordering fresh water in the lowlands to 1,500 m (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 western yellow-billed cuckoo is poorly known.

Migration

Little is known about migratory habitat for the western yellow-billed cuckoo. Yellow-billed cuckoos 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 yellow-billed cuckoo during migration are not as restricted as their habitat needs when nesting and tending young.

Habitat and Life History

Yellow-billed cuckoos forage primarily by gleaning insects from vegetation, but they may also capture flying insects or small vertebrates such as tree 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 include 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, 66 FR 38611) 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 riparian associations along water courses. 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, western yellow-billed cuckoos 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). Western yellow-billed cuckoo food availability is largely influenced by the health, density, and species of vegetation. Desiccated riparian sites produce fewer suitable insects than healthy moist sites.

Western populations of yellow-billed cuckoos 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 yellow-billed cuckoo 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 western yellow-billed cuckoo 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; western yellow-billed cuckoo 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).

Western yellow-billed cuckoos 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 western yellow-billed cuckoo 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, yellow-billed cuckoos 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). In a study on the lower Colorado River, three nests were estimated to have first fledged young during August 25 to 28 had they not failed. If these nests had successfully fledged young, the birds may still have been present at their respective breeding sites at least until September 15 to 18 (previously discussed in McNeil *et al.* 2012).

The western yellow-billed cuckoo 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 [100 m]). In the southwest, it can also breed in narrower reaches of riparian 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 (2,154 m)(or slightly higher in western Colorado, Utah, and Wyoming) in elevation. The moist conditions that support riparian plant communities that provide western yellow-billed cuckoo habitat typically exist in lower elevation, broad floodplains, as well as where rivers and streams

enter impoundments. In southeastern Arizona, however, cuckoos were often found nesting along intermittent drainages with dense stands of velvet mesquite and netleaf hackberry (Corman and Wise-Gervais 2005, Arizona Game and Fish Department 2011). Yellow-billed cuckoos are infrequently encountered along higher mountain drainages where Arizona sycamore or Arizona alder are the dominant riparian species. 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 U.S. Fish and Wildlife Service 2001). In the extreme southern portion of their summer range in the States of Sonora (southern quarter) and Sinaloa, Mexico, western yellow-billed cuckoos also nest in upland thorn scrub and dry deciduous habitats away from the riparian zone (Russell and Monson 1998), though their densities are lower in these habitats than they are in adjacent riparian areas.
At the landscape level, the available information suggests the western yellow-billed cuckoo 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 (81 ha) 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 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 (40 ha), and home ranges up to 500 ac (202 ha) 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, western yellow-billed cuckoos need adequate foraging areas near the nest. Foraging areas can be less dense or patchy with lower levels of canopy cover and often have a high proportion of cottonwoods in the canopy. 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 (U.S. Fish and Wildlife Service 2013).

Riparian habitat is dynamic, and species may move from one area to another over time. Western yellow-billed cuckoos 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 western yellow-billed cuckoos are found at riparian sites with small groves or strips of trees, sometimes less than 10 ac (4 ha) 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.

Habitat for the western yellow-billed cuckoo is largely associated with perennial rivers and streams that support the expanse of vegetation characteristics needed by breeding western yellow-billed cuckoos. The range and variation of stream flow frequency, magnitude, duration, and timing that will establish and maintain western yellow-billed cuckoo 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; U. S. Fish and Wildlife Service 2002, 78 FR 61622).

Hydrologic conditions at western yellow-billed cuckoo 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 western yellow-billed cuckoo populations. This year-to-year change in hydrology can affect food availability and habitat suitability for western yellow-billed cuckoos. In some areas, managed hydrologic cycles above or below dams can create temporary western yellow-billed cuckoo 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 western yellow-billed cuckoo 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; U. S. Fish and Wildlife Service 2002, 78 FR 61622).

Humid conditions created by surface and subsurface moisture appear to be important habitat parameters for western yellow-billed cuckoo. 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). Western yellow-billed cuckoos have evolved larger eggs and thicker eggshells, which would help them cope with potentially 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 western yellow-billed cuckoo nest sites had significantly higher daytime relative humidity (6–13% higher) and significantly lower daytime temperatures (2–4o F [1–2o C] 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 western yellow-billed cuckoo habitat. Where groundwater levels are elevated so riparian forest trees can access the water, habitat for nesting, foraging, and migrating western yellow-billed cuckoos can develop and thrive. Goodding's willows (*Salix gooddingii*) and Fremont cottonwoods do not regenerate if the groundwater levels fall below 6 ft (2 m)(Shafroth *et al.* 2000). Goodding's willows cannot survive if groundwater levels drop below 10 ft (3 m), and Fremont cottonwoods cannot survive if groundwater drops below 16 ft (5 m)(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).

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 western yellow-billed cuckoo habitat. These sediments become seedbeds for germination and growth of the riparian vegetation upon which western yellow-billed cuckoos 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 western yellow-billed cuckoo nesting and foraging.

Arizona

At present, it appears that the State's population could be as low as 170 pairs of yellow-billed cuckoos, and probably does not exceed 250 pairs. The population of the western yellow-billed cuckoo in Arizona is the largest in the United States (U.S. Fish and Wildlife Service 2013).

The yellow-billed cuckoo was historically widespread and locally common in Arizona (Phillips *et al.* 1964, Groschupf 1987). Although Arizona probably contains the largest remaining western yellow-billed cuckoo 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), western yellow-billed cuckoos 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 yellow-billed cuckoos (Brand *et al.* 2009).

A 1976 study based on existing habitat and known yellow-billed cuckoo population densities estimated 846 pairs were present on the lower Colorado River and its five major tributaries in Arizona (Groschupf 1987). In a statewide survey in 1999 that covered 265 mi (426 km) of river and creek bottoms, 172 yellow-billed cuckoo pairs and 81 single birds were located in Arizona (Corman and Magill 2000). Yellow-billed cuckoo 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 National Wildlife Refuge (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 yellow-billed cuckoo 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. Yellow-billed cuckoo sightings reported by birders between 15 June and 31 August, 1998 to 2012, in more than one year in southeastern Arizona mountain ranges include 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). Yellow-billed cuckoos are breeding in at least some of these locations, with nesting confirmed at Sycamore Canyon (AGFD, unpublished data).

Threats

The western yellow-billed cuckoo 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 yellow-billed cuckoo 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 western yellow-billed cuckoo 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, 78 FR 61622). 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; U. S. Fish and Wildlife Service 2001, 78 FR 61622). 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 western yellow-billed cuckoo habitat are ongoing. Such a loss of riparian habitat leads

not only to a direct reduction in yellow-billed cuckoo 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 yellow-billed cuckoos U.S. Fish and Wildlife Service 2013).

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

Factor E threats, including habitat rarity and small, isolated populations of the western yellow-billed cuckoo, 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 western yellow-billed cuckoo 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 western yellow-billed cuckoos. 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 western yellow-billed cuckoo, 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 western yellow-billed cuckoo. 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 western yellow-billed cuckoo occurs. As a result, the potential exists for pesticides to directly affect (poisoning individual cuckoos) 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 western yellow-billed cuckoo and its habitat.

Proposed Critical Habitat

Critical habitat units have been proposed in Arizona, California, Colorado, Idaho, New Mexico, Nevada, Texas, Utah, Wyoming totaling 242,859 acres. Within these areas, the primary constituent elements of the physical or biological features essential to the conservation of western yellow-billed cuckoo consist of three components:

1. *Riparian woodlands.* Riparian woodlands with mixed willow cottonwood vegetation, mesquite-thorn forest vegetation, or a combination of these that contain habitat for nesting and foraging in contiguous or nearly contiguous patches that are greater than 325 feet (100 meters) in width and 200 acres (81 hectares) or more in extent. These habitat patches contain one or more nesting groves, which are generally willow-dominated, have above average

canopy closure (greater than 70 percent), and have a cooler, more humid environment than the surrounding riparian and upland habitats.

2. *Adequate prey base.* Presence of a prey base consisting of large insect fauna (for example, cicadas, caterpillars, katydids, grasshoppers, large beetles, dragonflies) and tree frogs for adults and young in breeding areas during the nesting season and in post-breeding dispersal areas.
3. *Dynamic riverine processes.* River systems that are dynamic and provide hydrologic processes that encourage sediment movement and deposits that allow seedling germination and promote plant growth, maintenance, health, and vigor (e.g. lower gradient streams and broad floodplains, elevated subsurface groundwater table, and perennial rivers and streams). This allows habitat to regenerate at regular intervals, leading to riparian vegetation with variously aged patches from young to old. These dynamic riverine processes are considered essential for developing and maintaining the primary constituent elements as described above for Riparian Woodlands and Adequate Prey Base.

ENVIRONMENTAL BASELINE

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

Description of the Action Area

The action area for this BO is defined as a one-mile buffer on either side of the centerline of the Agency Preferred Alternative in the New Build Section and a 500-foot corridor (200 feet off of the existing 100-foot-wide ROW) (see BO Figure 1) in the Upgrade Section, as well as any identified substations, staging areas, or access roads outside those corridors.

The New Build Section of the proposed project would be located within the Mexican Highland Subprovince of the Basin and Range Physiographic Province. This area is characterized by numerous elongated, subparallel mountain ranges and intervening broad alluvial basins that formed during Late Cenozoic extension. The Upgrade Section of the proposed project would be located in the eastern edge of the Sonoran Desert Subprovince of the Basin and Range Physiographic Province. This area is dominated by basins filled with sediments separated by uplifted mountain blocks. Major basins include the Avra Valley, Tucson Basin, San Pedro Valley, and Willcox Playa (Trapp and Reynolds 1995). The San Pedro River drains the San Pedro Basin. Mountain ranges include the Tucson Mountains, west of Tucson; the Tortolita Mountains, northwest of Tucson; the Santa Catalina Mountains, northeast of Tucson; and the Rincon Mountains, east of Tucson.

The proposed project would cross six biotic communities of the Southwest (Brown and Lowe 1980), including Semidesert Grassland, Chihuahuan Desertscrub, Playa, Arizona Upland

Subdivision of Sonoran Desertscrub, Lower Colorado River Subdivision of Sonoran Desertscrub, and Madrean Evergreen Woodland.

Status and Factors Affecting the Species and Critical Habitat Within the Action Area

Lesser Long-Nosed Bat

Within the action area there are no known lesser long-nosed bat roost locations. Most records for this species in the United States are from mine or cave roosts (Findley *et al.* 1975, Hoffmeister 1986) and there are multiple roost locations within 40 miles of the action area in Hidalgo, Cochise, Pima, and Pinal counties in route groups 2, 3, and 4 (BO Figure 1). As lesser long-nosed bats are capable of foraging up to 40 miles one way from roost locations each night, it is assumed that the species could be present anywhere along the proposed project in route groups 2–4 where suitable foraging plants are present, and in urban areas where landscape plantings and hummingbird feeders provide a food source for the species. Individuals have been detected in Grant County, New Mexico, north of the project area (M. Ramsey, personal communication), and additional unknown roosts may be present within or near the action area.

Foraging Habitat in the Action Area

Forage plants utilized by lesser long-nosed bats are not uniformly distributed across the landscape in the action area. Saguaro (*Carnegiea gigantea*), *Agave palmeri*, and *Agave chrysantha* are common forage plants in the action area. *Agave parryi* may be found at higher elevations (Kearney and Peebles (1960) describe *Agave parryi* as occurring in Cochise and Pima counties at 4,500 to 8,000 feet). The distribution of saguaro includes the western portion of the action area from the San Pedro Valley extending west to the beginning of developed agricultural lands north of the Tucson Mountains (Shreve and Wiggins 1964). Slauson (2000) mapped the distribution of the lesser long-nosed bat relative to the distribution of *Agave palmeri* and *Agave chrysantha*, indicating the distribution of *A. chrysantha* in the western portion of action area, including the Winchester, Galiuro, Little Rincon, Rincon, and the north side of the Catalina Mountains. Slauson (2000) also indicates the distribution of *Agave palmeri* in the project area from approximately the Arizona-New Mexico state line west to the south end of the Rincon Mountains. Gentry (1982) indicates the distribution of *Agave palmeri* to include Hidalgo and Grant counties south of the Gila River and extreme western Luna County in Southwestern New Mexico in addition to southern Arizona, including portions of the action area. Shreve and Wiggins (1964) describe the saguaro as occurring on gravelly slopes, rocky ridges and outwash fans, the *Agave palmeri* as occurring on rocky hillsides and mesas, and *Agave chrysantha* occurring on arid foothills and mountain slopes. As described by Howell and Roth (1981), and others, *Agave palmeri* is patchily distributed. Ober *et al.* (2005) report variability between years in abundance of agave inflorescences and variation in calculated home ranges of radio telemetered lesser long-nosed bats as food resources varied. Ober *et al.* (2005) found that lesser long-nosed bats would change foraging areas upon cessation of agave nectar production and would vary activity patterns by increasing time spent foraging in periods of reduced forage availability, noting a change from a mean of 2.3 hours per night spent foraging in a relatively good year to 5.1 hours per night the following year when *Agave* inflorescences were less abundant. Since *Agave* plants die after flowering there is likely to be inter-annual variability of

availability of *Agave* nectar, which is further confounded by variability in precipitation affecting *Agave* reproduction and growth. Lesser long-nosed bats forage over large areas in response to food availability both between and within years.

Forage plants for the species include columnar cacti and paniculate agaves, which could be removed or trimmed during construction activities and as needed during maintenance. Lesser long-nosed bat foraging habitat is found predominately in the rebuild section of the project. The existing Saguaro-Tucson and Tucson-Apache 115 kV transmission lines that would be upgraded have been in place since the 1950s on a 100-foot ROW and vegetation within the ROW has been maintained to comply with conductor to vegetation clearance standards on an as needed basis. From the Saguaro Substation to the Tucson Substation saguaros are generally found in foothill and mountainous areas although individual plants can occur on the valley floor. More specifically, saguaros occur as individuals or in groups of 2-3 from Twin Peaks Road to Silverbell Road and west of Silverbell Road in undeveloped areas. From the Tucson Substation eastward Saguaros occur as scattered individuals from Silverbell Road to Anklam Road, across the Tumamoc Hill property to Starr Pass Boulevard, and in open areas to Ajo Way. From Ajo Way to Mission Road the existing line to be replaced is a very high span from Ajo Way to the top of a ridge in Tucson Mountain Park then down again as a high span, with clumps of saguaro occurring west of Mission Road. From Swan Road to Wentworth Road saguaros occur as scattered individuals. Because of the scattered nature of saguaro distribution impacts to foraging habitat will be localized. Paniculate agaves are localized in hilly terrain east of Highway 83 to Apache Substation. Impacts to saguaros and paniculate agaves may occur from offsetting the ROW for the rebuild section to allow construction while maintaining service on the existing lines and from vegetation maintenance along the rebuilt transmission line.

In the new build section of the project, impacts to lesser long-nosed bat paniculate agave based foraging habitat are most likely where the route crosses mountainous terrain, particularly crossing the Peloncillo Mountains, east to the Hidalgo Substation.

Mexican Long-nosed Bat

Within the action area there are no known Mexican long-nosed bat roost locations. However, there are multiple roost locations in the boot heel of New Mexico that the species utilizes along with the lesser long-nosed bat within 40 miles of the project area. The nearest known roost location is approximately 10 miles south of the proposed project area along segment LD4. Because Mexican long-nosed bats are capable of foraging up to 40 miles one way from day roost locations each night, it is assumed that the species could be present anywhere along the preferred alternative in route groups 1 and 2 (BO Figure 1) where suitable forage plants (agaves) are present, and in urban areas where landscape plantings and hummingbird feeders provide a food source for the species. Individuals have been detected in Grant County, New Mexico, north of the project area (M. Ramsey, personal communication), and additional unknown roosts may be present within or near the action area. See discussion of agave foraging habitat in the action area under lesser long-nosed bat.

Pima Pineapple Cactus

The portions of the action area that could support the Pima pineapple cactus are, generally, from the area of the Pantano Substation, between Cienega Creek and Davidson Canyon and the area of Del Bac Substation, near Interstate 19 and Valencia Road. Roller (1996) mapped the known distribution of Pima pineapple cacti, locating the species in the vicinity of Vail north and south of Interstate 10 and east and west of State Route 83 and west of Interstate 19 south of Tucson. Baker (2006b) surveyed lands along a portion of the proposed project route and modelled predicted habitat based on sightings of Pima pineapple cacti. Based on Baker (2006b) polygons within 500 meters of known individual Pima pineapple cacti and of predicted habitat overlay the proposed project route. Pima pineapple cacti have been found in the vicinity of the Nogales Substation within the area of the proposed project (Johnida Dockens, Pers. Comm.).

Southwestern Willow Flycatcher

Within the action area at the proposed crossings of the San Pedro River and Cienega Creek, there is no southwestern willow flycatcher nesting habitat. These areas lack a permanent or semi-permanent water source and water is likely only present in the area as a result of precipitation events. A review of Google Earth images of the proposed crossing of the San Pedro River for November 14, 1992, May 31, 1996, October 5, 2002, September 20, 2003, December 22, 2005, October 1, 2006, June 20, 2007, May 23, 2009, September 9, 2010, April 29, 2011, and June 11, 2011 showed water in the river channel only on October 1, 2006. A review of Google Earth images of the proposed crossing of Cienega Creek for November 14, 1992, May 31, 1996, September 20, 2003, May 30, 2005, June 15, 2006, June 20, 2007, September 9, 2010, and June 11, 2011 showed no water in the creek channel.

No southwestern willow flycatcher designated critical habitat is present in the action area. Critical habitat is found along the San Pedro River approximately 10 airline miles north (downstream) of the proposed project area and along Cienega Creek approximately 4.9 airline miles south (upstream) of the proposed project area.

The proposed crossing of the San Pedro River floodplain is approximately 850 feet wide, including an open, active, channel approximately 100 feet wide. A stand of salt cedar (*Tamarix ramossisma*) occurs on the west-side floodplain. There is a density gradient within the stand with the densest areas of salt cedar occurring on the western edge of the floodplain on a point bar, extending approximately 400 feet to the east. The eastern bank of the San Pedro River channel is a high cut bank with little streambank vegetation. Velvet mesquite (*Prosopis velutina*)–dominated shrublands occur east of the eastern bank. The proposed crossing lacks a permanent or semi-permanent source of water or saturated soils that are typically found in areas utilized by southwestern willow flycatcher for breeding, but the area provides migratory and foraging habitat for southwestern willow flycatcher.

At the proposed crossing of Cienega Creek, the active, open, channel of the creek is approximately 215 feet wide with a band of velvet mesquite trees on the west bank approximately 40-45 feet wide. The proposed crossing lacks a permanent or semi-permanent source of water or saturated soils that are typically found in areas utilized by southwestern

willow flycatcher for breeding but the area provides migratory and foraging habitat for southwestern willow flycatcher.

The proposed crossings of the Santa Cruz River occur within urban habitats and are generally in areas of limited to no riparian vegetation that are not habitat for the species. In areas where riparian vegetation is present within the project area, habitat may be suitable for migrating southwestern willow flycatchers. In the Saguaro Substation-Tucson Substation segment within the action area, the proposed project route parallels riparian habitat, supported by sewage effluent, including a total of approximately 2.5 linear miles of project length, between El Camino del Cerro and Ina Road, east of Silverbell Road. However, there are no records of the species from the Santa Cruz River in the action area.

No southwestern willow flycatcher populations are known in the action area in New Mexico.

Northern Mexican Gartersnake

Northern Mexican gartersnakes were historically found in most permanent rivers and streams in southern and central Arizona, including Cienega Creek and the San Pedro River. Vegetation and habitat conditions at the proposed crossings of the San Pedro River and Cienega Creek are described under southwestern willow flycatcher above. Habitat at the proposed crossings of the San Pedro River and Cienega Creek does not include perennial or semi-permanent aquatic habitat (see discussion of water in the stream under southwestern willow flycatcher above). The project area is considered occupied because the project area crosses proposed critical habitat (78 FR 41558). We anticipate that individuals occur intermittently in the project area when dispersing to areas with perennial water or when prey are conspicuously present in the project area. Most use by individuals would be in the riparian area, but some use may occur outside the riparian area within the dryer terrestrial habitat. Within the San Pedro River and Cienega Creek, northern Mexican gartersnakes are more likely to occur in those areas with appropriate prey species (native fish) and less likely to occur in areas with non-native predators/competitors (bullfrogs, spiny-rayed fish).

The FWS is proposing critical habitat for this species along both Cienega Creek and the San Pedro River (78 FR 41549) in areas that would be crossed by the proposed project. The proposed project would cross proposed critical habitat in the Cienega Creek Subbasin Critical Habitat Unit and the San Pedro River Subbasin Critical Habitat Unit.

Yellow-billed Cuckoo

No species-specific surveys have been conducted for yellow-billed cuckoo for the purposes of this proposed project. However, the yellow-billed cuckoo is known from the San Pedro River to the south and north of the action area (79 FR 48565). The San Pedro River at the proposed crossing location is approximately 850 feet wide with a thick stand of saltcedar (*Tamarix* sp.) trees in the channel and velvet mesquite (*Prosopis velutina*)–dominated shrublands on the eastern bank. This area lacks a permanent or semi-permanent water source and water is likely only present in the area as a result of precipitation events. The riparian vegetation in this area lacks the multiple layers of canopy and subcanopy and well developed understory preferred as

breeding habitat by the yellow-billed cuckoo. Also lacking are the native tree species that are important components to breeding habitat. Foraging and migratory habitat in the form of sparse riparian deciduous and upland mesquite vegetation is present at the proposed crossing of the San Pedro River and Cienega Creek. Large blocks of riparian vegetation utilized by the species for breeding are not present in the project area, but the area along Cienega Creek downstream are consistently used for breeding (79 FR 48565).

The proposed crossings of the Santa Cruz River occur within urban habitats and are generally in areas of limited to no riparian vegetation that are not habitat for the species. In areas where riparian vegetation is present within the project area, habitat may be suitable for migrating yellow-billed cuckoo. There are records of the species from the Santa Cruz River near the study area, but no records of breeding.

No yellow-billed cuckoo populations are known in the study area in New Mexico, but the species could occur where the Gila River watershed overlaps with the study area. Thus some individual birds could follow drainages within the study area during migration.
The San Pedro River is not a regulated river but flows are subject to depletion through groundwater pumping. Entrenchment of the upper San Pedro and deposition of alluvium downstream has altered the river from the pre-settlement period, apparently due to historic heavy livestock use and flooding (Hereford 1993). These factors constrain development of physical and biological features of habitat for yellow-billed cuckoo. The San Pedro River from San Manuel upstream to St. David has not been well surveyed for yellow-billed cuckoo and much of it is private land. However, suitable habitat exists in this reach. Yellow-billed cuckoos are documented at the Three Links conservation property approximately 12 miles north of the proposed project crossing. Although the number of breeding territories at the Three Links site is unknown, repeated yellow-billed cuckoo detections a) during at least 2 of 3 southwestern willow flycatcher survey periods in 2004, 2005, 2006, 2008, 2009, 2010, 2011, and 2013 and b) during yellow-billed cuckoo breeding season playback surveys in 2012 and 2013 indicate a breeding population exists (Tucson Audubon, unpublished data; USBR, unpublished data). The area beginning approximately nine miles south of the proposed project crossing and extending southward is one of the largest remaining breeding groups of the western yellow-billed cuckoo and is consistently occupied by a large number of pairs (79 FR 48563).

Proposed critical habitat occurs in lower Cienega Creek in Unit 38. There is very little habitat for cuckoos within this area, but portions of Unit 38 downstream of the project area are consistently occupied by cuckoos during the breeding season (79 FR 48565).

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, which 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.

Emergency maintenance may be needed during the life of the permit in order continue transmission of power. This may include repair of transmission lines or repair or replace damaged equipment. Effects to habitat will be the same as the installation and regular maintenance of the transmission line. Emergency actions may occur during breeding seasons, which may affect migrating or foraging individuals, which are addressed for each species.

While changes to vegetation and water availability may occur during the 50-year life of the permit, we do not expect these changes to be substantial so the condition of the action area will not change substantially for the species addressed, e.g., breeding habitat for riparian species will not develop where there is no breeding habitat now. Climate change will continue to limit increases in water flow, riparian vegetation development, and, possibly, upland vegetation development, and maintenance activities will continue to limit development of large trees along the line.

Lesser Long-Nosed Bat

There are no known mines, caves, or lesser long-nosed bat roost sites within the action area. The nearest known lesser long-nosed bat roost site is approximately 10 miles from the proposed project. As such, no impacts on known roost sites or individual bats at roost sites from the proposed project are anticipated. Recent ongoing research has detected additional roosts in southern Arizona and New Mexico, and other roosts may be present and undetected thus far.

Potential impacts on the lesser long-nosed bat from the proposed project would include the loss or alteration of suitable foraging habitat. Forage plants for the species, including columnar cacti and paniculate agaves, would be removed or trimmed during construction activities and as needed during maintenance. Approximately 1,084 acres of disturbance would occur to vegetation communities where suitable forage plants for the lesser long-nosed bat would be present in route groups 2–4 (BO Figure 1). This would be approximately 25 percent of the 4,270 acres of available habitat within the proposed ROW and less than 2 percent of the approximately 68,856 acres of available habitat within the action area (500-foot -wide corridor on rebuild and 2-mile-wide corridor on new build).

As forage plants are not present throughout the entire area to be disturbed, the total area of lesser long-nosed bat foraging habitat impacted would be less than the area of disturbance. Within the area to be disturbed, areas with saguaros (*Carnegiea gigantea*) and paniculate agaves would be avoided where possible. Where removal of these plants would be required they would be transplanted outside of the area of ground disturbance and would be used in reclamation activities. Agave and saguaros would be augmented as necessary to achieve a goal of no net loss of mature flowering plants. Mortality of some plants would be expected during transplanting operations and, despite mitigation, a temporary loss of foraging plants would occur during the establishment of salvaged and additional agaves and saguaros used to achieve no net loss of mature flowering plants. Foraging by lesser long-nosed bats would continue in the general area at current levels because of the relatively small area of forage that will be affected.

Mexican Long-nosed Bat

There are no known mines, caves, or Mexican long-nosed bat roost sites within the ROW for the proposed project. The nearest known Mexican long-nosed bat roost site is approximately 10 miles from the proposed project. As such, no impacts on known roost sites or individual bats from the proposed project are anticipated. Recent ongoing research has detected additional roosts in southern Arizona and New Mexico, and other roosts may be present and undetected thus far.

Potential impacts on the Mexican long-nosed bat from the proposed project would include the loss or alteration of suitable foraging habitat and potential noise and vibration impacts. Forage plants for the species, including columnar cacti and paniculate agaves, would be removed or trimmed during construction activities and as needed during maintenance. Approximately 509 acres of disturbance would occur in vegetation communities where suitable forage plants for the Mexican long-nosed bat are present in route groups 1 and 2. This would be approximately 23 percent of the 2,215 acres of available habitat within the proposed ROW. As foraging plants are not present throughout the entire area to be disturbed, the total area of Mexican long-nosed bat foraging habitat impacted would be less than the area of disturbance. Within the area to be disturbed, areas with paniculate agaves would be avoided where possible. Where removal of these plants would be required, they would be transplanted outside of the area of ground disturbance and used in reclamation activities. Agave and saguaros would be augmented as necessary to achieve a goal of no net loss of mature flowering plants. Mortality of some plants would be expected during transplanting operations and, despite mitigation, a temporary loss of foraging plants would occur while salvaged and additional agaves and saguaros used to achieve no net loss of mature flowering plants become established. Foraging by Mexican long-nosed bats would continue in the general area at current levels because of the relatively small area of forage that will be affected.

Pima Pineapple Cactus

Potential impacts on the Pima pineapple cactus from the proposed project include direct loss of individual plants and changes to habitat from the establishment and spread of invasive plants. Ground disturbance to Pima pineapple cactus habitat would occur during the construction phase of the proposed project from the construction of new access roads, pulling and tensioning sites, and structure work areas. Ground disturbance may directly affect the Pima pineapple cactus through direct loss of individual plants and may indirectly affect the species by facilitating the establishment and spread of invasive plant species. Ground disturbance would occur on approximately155 acres of Pima pineapple cactus habitat within the project ROW. This would be approximately 28 percent of the 554 acres of habitat within the 150-foot-wide ROW and 8 percent of the approximately 1,845 acres of habitat in the 500-foot-wide action area. Ground-disturbing activities could lead to increased establishment and spread of invasive plant species, which can compete with the Pima pineapple cactus for space and resources and could modify fire regimes in habitat that could lead to increased mortality for the species and degradation of habitat. Measures to minimize the establishment and spread of invasive plant species would minimize the potential for indirect effects on the Pima pineapple cactus from the proposed project. Effects to individuals will be minimized through implementation of conservation

measures, including purchasing credits in a FWS-approved conservation bank for Pima pineapple cactus, corresponding to the area of disturbance to Pima pineapple cactus habitat; flagging individuals prior to the commencement of work to avoid accidental damage during construction; and relocating any Pima pineapple cactus that cannot be avoided, if possible.

Southwestern Willow Flycatcher

Nesting habitat for the southwestern willow flycatcher is not currently present at the proposed crossings of the San Pedro River, Santa Cruz River, or Cienega Creek. Surface water at the proposed crossings is present ephemerally and only in response to precipitation events. We do not expect that the conditions at these crossings will change during the life of the permit. Thus, no impacts from the proposed project on nesting southwestern willow flycatchers are anticipated.

Habitat at the proposed crossings of the San Pedro River, Cienega Creek, and the Santa Cruz River is suitable for foraging and migrating southwestern willow flycatchers. Construction activities would avoid ground disturbance and would not place structures or access roads in riparian woodlands. The areas with riparian woodland vegetation would be spanned by the proposed transmission line. All non-emergency construction and maintenance in riparian woodlands at the San Pedro River, Cienega Creek, and the Santa Cruz River would take place between September 15 and March 1, to avoid disturbance of southwestern willow flycatchers.

Vegetation within the ROW would be managed to maintain clearance between vegetation and transmission lines. This could include removing vegetation or topping of trees in the ROW. This maintenance would occur as needed, likely every three to five years. To avoid impacts on or disturbance to southwestern willow flycatcher, any vegetation management at the crossings of the San Pedro River and Cienega Creek would occur outside of the breeding season with the exception of emergency situations, and would be limited to the minimum vegetation removal required to maintain clearance between vegetation and the transmission lines. Emergency maintenance may occur during the breeding season, which may result in migrating or foraging southwestern willow flycatchers to be displaced temporarily. This displacement will not affect their survival, and individuals will likely resume normal behavior after the emergency maintenance is complete. We anticipate that vegetation conditions will remain that provide foraging and migrating habitat.

The presence of a larger set of cables (from 3 conductors and 2 shield wires on the existing transmission line to 6 conductors and 2 shield wires on the rebuilt line) replacing the existing line across the San Pedro River, Cienega Creek, and the Santa Cruz River could increase the potential for southwestern willow flycatcher collisions with the transmission lines. However, the likelihood of collisions increasing would be small due to the size and maneuverability of the species. In order to minimize the potential risk for bird collisions with transmission lines, the lines and structures would be designed in accordance with "Reducing Avian Collision with Power Lines" (APLIC 2012) and line marking devices would be placed at the proposed crossings of the San Pedro River, Cienega Creek, and the Santa Cruz River.

No designated critical habitat for the southwestern willow flycatcher is present in the action area. The nearest designated critical habitat is approximately 9 miles north of the action area

(downstream) on the San Pedro River and approximately 12 miles north (upstream) of the action area along the Gila River in New Mexico. As no designated critical habitat is present in the proposed project area and there would be no impacts downstream, no effects from the proposed project on southwestern willow flycatcher designated critical habitat are anticipated.

Northern Mexican Gartersnake

Potential direct effects to individuals would include being harmed or killed by vehicles and other equipment used during installation and maintenance activities outside the riparian area. Considering that individuals would occur intermittently and that ground actions would occur outside the riparian area in the drier terrestrial areas, we are reasonably certain that the likelihood of individuals being directly affected would be small. We do not expect changes to the habitat in the area to occur that would change use by the northern Mexican gartersnakes to be other than intermittent in the future.

No ground disturbance would occur in riparian areas at the proposed crossings of Cienega Creek and the San Pedro River. Habitat upslope of riparian areas may be affected within the right-of-way to maintain clearance between vegetation and transmission lines. This maintenance would occur as needed, likely every three to five years. To minimize impacts on northern Mexican gartersnake habitat and proposed critical habitat, any vegetation management at the crossings of the San Pedro River and Cienega Creek would be limited to the minimum vegetation removal required to maintain clearance between vegetation and the transmission lines, maintaining some habitat characteristics for northern Mexican gartersnakes.

The proposed action would not affect any of the proposed critical habitat PCEs for aquatic or riparian habitat that would preclude development for gartersnakes, but may affect the PCE of adequate terrestrial space by removing some vegetation. None of these actions are expected to preclude development of habitat in the general area if water availability changes.

Yellow-billed Cuckoo

Yellow-billed cuckoo nesting habitat is not present within the project area, but is present downstream of the project area at Cienega Creek. No impacts from the proposed project on nesting yellow-billed cuckoos are anticipated because nesting habitat will not be affected and we do not anticipate that nesting habitat will develop within the project area during the life of the permit.

Habitat at the proposed crossings of the San Pedro River, Cienega Creek, and the Santa Cruz River is likely suitable as foraging and/or migratory habitat for the species. Siting of the proposed transmission line would be done in a way that no ground disturbance, structures, or access roads would occur within riparian woodlands. Vegetation would be managed within the ROW to maintain vertical clearance between vegetation and transmission lines. This could include removing vegetation in the ROW. This maintenance would occur as needed, likely every three to five years. To avoid impacts on yellow-billed cuckoo any vegetation management at the crossings of the San Pedro River, Cienega Creek, and Santa Cruz River would occur outside of the breeding season with the exception of emergency situations, and would be limited to the minimum vegetation removal required to maintain clearance between vegetation and the

transmission lines. Emergency maintenance may occur during the breeding season, which may result in migrating or foraging yellow-billed cuckoos to be displaced temporarily. This displacement will not affect their survival, and individuals will likely resume normal behavior after the emergency maintenance is complete.

The presence of a larger set of cables (from 3 conductors and 2 shield wires on the existing transmission line to 6 conductors and 2 shield wires on the rebuilt line) replacing the existing line across the San Pedro River, Cienega Creek, and the Santa Cruz River could increase the potential for southwestern willow flycatcher collisions with the transmission lines. In order to minimize the potential risk for bird collisions with transmission lines the lines and structures would be designed in accordance with "Reducing Avian Collision with Power Lines" (APLIC 2012) and line marking devices would be placed at the proposed crossings of the San Pedro River, Cienega Creek, and the Santa Cruz River.

Proposed critical habitat

Maintenance of the line may affect riparian woodlands along the line within the project area because vegetation, including trees, will be managed to maintain clearance between the lines and vegetation. This may involve the trimming or removal of trees, which will limit canopy cover. The action area outside the project area will not be affected, so that the size of riparian woodlands, in general, will continue to increase and decrease under current processes which will not be affected by the proposed action.

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.

Lesser Long-Nosed Bat and Mexican Long-nosed Bat

Livestock grazing on private property and on lands managed by the ASLD and New Mexico State Land Office may affect foraging habitat for the long-nosed bats. Other unregulated activities including trespass livestock, inappropriate off-highway vehicle (OHV) use, and cross-border activities could impact lesser long-nosed bat habitat.

Pima Pineapple Cactus

Habitat for the Pima pineapple cactus includes areas of private lands and lands managed by the ASLD where livestock grazing could occur. Livestock grazing activities could lead to direct mortality of Pima pineapple cactus and modification of habitat through the establishment and spread of invasive plant species. Other, unregulated, activities, including trespass livestock, inappropriate OHV use, and cross-border activities, could impact Pima pineapple cactus habitat.

Southwestern Willow Flycatcher

The proposed crossing of the San Pedro River is located on private land and cattle grazing on these lands could impact habitat for the species. Upstream water use and groundwater pumping in the area limit opportunities for development of quality habitat for southwestern willow flycatcher in the vicinity of the proposed crossing. The proposed crossing of Cienega Creek is on Arizona State Trust Land and cattle grazing could impact habitat for the species. Inappropriate off-high-vehicle (OHV) use could impact southwestern willow flycatcher habitat.

Northern Mexican Gartersnake

The proposed crossing of the San Pedro River is located on private land and cattle grazing on these lands could directly impact or impact habitat for the species. Upstream water use and groundwater pumping in the area limit opportunities for development of quality habitat for northern Mexican gartersnake in the vicinity of the proposed crossing. The proposed crossing of Cienega Creek is on Arizona State Trust Land and cattle grazing could directly or indirectly impact habitat for the species. Inappropriate off-high-vehicle (OHV) use could impact northern Mexican gartersnake habitat.

Yellow-billed Cuckoo

Cumulative impacts to habitat at the San Pedro River and Cienega Creek crossing are similar to the southwestern willow flycatcher.

CONCLUSION

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.

This biological opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

Lesser Long-nosed Bat

After reviewing the current status of the lesser long-nosed bat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the FWS's biological opinion that the proposed action is not likely to jeopardize the continued existence of the lesser long-nosed bat. No critical habitat has been designated for the lesser long-nosed bat, therefore, none will be affected. We base these conclusions on the following reasons:

1. No lesser long-nosed bat roosts would be affected.
2. Forage plants will not be affected to the extent that would preclude bat foraging within the action area because of the relatively small area of forage that will be affected.

3. Forage plants will be avoided where possible, and some plants will be transplanted and used in reclamation activities to achieve a goal of no net loss of mature flowering bat forage plants.

Mexican long-nosed bat

After reviewing the current status of Mexican long-nosed bat, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the FWS's biological opinion that the proposed action is not likely to jeopardize the continued existence of the Mexican long-nosed bat. No critical habitat has been designated for the lesser long-nosed bat, therefore, none will be affected. We base these conclusions on the following reasons:

1. No known Mexican long-nosed bat roosts would be affected.
2. Forage plants will not be affected to the extent that would preclude bat foraging within the action area because of the relatively small area of forage that will be affected.
3. Forage plants will be avoided where possible, and some plants will be transplanted and used in reclamation activities to achieve a goal of no net loss of mature flowering bat forage plants.

Pima pineapple cactus

After reviewing the current status of Pima pineapple cactus, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the FWS's biological opinion that the proposed action is not likely to jeopardize the continued existence of the Pima pineapple cactus. No critical habitat has been designated for the lesser long-nosed bat, therefore, none will be affected. We base these conclusions on the following reasons:

1. Individual plants will be avoided when possible. If avoidance is not possible, individual plants will be relocated.
2. Credits will be purchased in a FWS-approved conservation bank, corresponding to the area of disturbance to Pima pineapple cactus habitat resulting from the proposed action.

Southwestern willow flycatcher and critical habitat

After reviewing the current status of southwestern willow flycatcher, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the FWS's biological opinion that the proposed action is neither likely to jeopardize the continued existence of the southwestern willow flycatcher, nor likely to destroy or adversely modify designated critical habitat for southwestern willow flycatcher. We base these conclusions on the following reasons:

1. Breeding will not be affected because there is no breeding habitat within the project area, and breeding habitat is not expected to develop during the term of the permit.
2. Most migrating and foraging individuals will not be affected during development or regular maintenance because proposed actions will occur at the crossings of the San Pedro River and

Cienega Creek only outside of the breeding season. Emergency maintenance may affect migrating or foraging individuals, but this will not affect their survival, and individuals will resume their normal activities after the emergency maintenance.

3. Habitat within riparian areas would only be affected by maintenance actions which would require the removal of vegetation to maintain line clearance. This would affect trees within the project area, but would not affect trees within the remainder of the action area.
4. Critical habitat would not be affected because none occurs within the action area.

Northern Mexican gartersnake and proposed critical habitat

After reviewing the current status of the northern Mexican gartersnake, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the FWS's biological opinion that the proposed action is not likely to jeopardize the continued existence of the northern Mexican gartersnake, and it is our conference opinion that the proposed action is not likely to destroy or adversely modify proposed critical habitat for the northern Mexican gartersnake. We base these conclusions on the following reasons:

1. The likelihood of individuals being directly affected would be small, considering that significant populations of known prey species are not known within the proposed action's footprint, individuals would occur intermittently in the project area (likely only during dispersal or flooding events), ground-disturbing actions would occur outside the riparian area in the dryer terrestrial areas, and no changes to the habitat in the action area are expected to occur that would change use by the northern Mexican gartersnakes to be other than intermittent in the future.
2. No ground disturbance would occur in riparian habitat at the proposed crossings of the San Pedro River and Cienega Creek. Maintaining clearance between vegetation and transmission lines may affect some habitat characteristics, but this would be limited to only what is necessary, maintaining some habitat characteristics.
3. Proposed critical habitat PCEs of aquatic or riparian habitat will not be affected. Some characteristics of adequate terrestrial space may be affected by removing vegetation, but none of these actions are expected to preclude development or maintenance of habitat in the general area.

Yellow-billed cuckoo western distinct population segment and proposed critical habitat

After reviewing the current status of yellow-billed cuckoo, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is the FWS's biological opinion that the proposed action is not likely to jeopardize the continued existence of the yellow-billed cuckoo, and it is our conference opinion that the proposed action is not likely to destroy or adversely modify proposed critical habitat for yellow-billed cuckoo. We base these conclusions on the following reasons:

1. Breeding will not be affected because there is no breeding habitat within the project area, and breeding habitat is not expected to develop during the term of the permit.
2. Most migrating and foraging individuals will not be affected during installation or regular maintenance because proposed actions will occur at the crossings of the San Pedro River and Cienega Creek only outside of the breeding season. Emergency maintenance may affect migrating or foraging individuals, but this will not affect their survival, and individuals will resume their normal activities after the emergency maintenance.
3. Habitat within riparian areas would only be affected by maintenance actions which would require the removal of vegetation to maintain line clearance. This would affect trees within the project area, but would not affect trees within the remainder of the action area.
4. While maintenance of the line may affect the riparian woodlands PCE of proposed critical habitat within the project area, the action area outside of the project area will not be affected, so that the size of riparian woodlands, in general, will continue to increase and decrease under current processes, which will not be affected by the proposed action.

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 defined (50 CFR 17.3) and means an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering. "Harass" is defined (50 CFR 17.3) and means an intentional or negligent act or omission which creates the likelihood of injury to wildlife by annoying it to such an extent as to significantly disrupt normal behavioral 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 Federal action agencies so that they become binding conditions of any grant or permit issued to Southline Transmission, LLC, as appropriate, for the exemption in section 7(o)(2) to apply. The Federal action agencies have a continuing duty to regulate the activity covered by this incidental take statement. If the Federal action agencies (1) fails to assume and implement the terms and conditions or (2) fails to require Southline Transmission, LLC 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 Federal action agencies or Southline Transmission, LLC must report the progress of the action and its impact on the species to the FWS as specified in the incidental take statement. [50 CFR § 402.14(i)(3)].

Sections 7(b)(4) and 7(o)(2) of the Act generally do not apply to listed plant species. However, limited protection of listed plants from take is provided to the extent that the Act prohibits the removal and reduction to possession of federally-listed endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any regulation of any State or in the course of any violation of a State criminal trespass law.

AMOUNT AND EXTENT OF TAKE

Lesser long-nosed bat and Mexican long-nosed bat

We do not anticipate that implementation of the proposed action is reasonably certain to result in the incidental take of any lesser long-nosed bat or Mexican long-nosed bat because:

1. No known bat roost would be affected, and
2. Forage plants will not be affected sufficient to preclude bat foraging from the action area because of the relatively small area of forage that will be affected.

Southwestern willow flycatcher and proposed yellow-billed cuckoo

We do not anticipate that implementation of the proposed action is reasonably certain to result in incidental take of any southwester willow flycatcher or yellow-billed cuckoo because:

1. Breeding will not be affected because there is no breeding habitat within the project area, and breeding habitat is not expected to develop during the term of the permit.
2. Most migrating and foraging individuals will not be affected during installation or regular maintenance because proposed actions will occur at the crossings of the San Pedro River and Cienega Creek only outside of the breeding season. Emergency maintenance may affect migrating or foraging individuals, but this will not affect their survival, and individuals will resume their normal activities after the emergency maintenance.

Northern Mexican gartersnake

We do not anticipate that implementation of the proposed action is reasonably certain to result in incidental take of any northern Mexican gartersnake because 1) significant populations of known prey species are not known within the proposed actions' footprint; 2) individuals would occur intermittently in the project area (likely only during dispersal or flooding events); 3) ground-disturbing actions would occur outside the riparian area in the dryer terrestrial areas; and 4) no changes to the habitat in the area are expected to occur that would change use by the northern Mexican gartersnakes to be other than intermittent in the future.

The Fish and Wildlife Service will not refer the incidental take of any migratory bird or bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), or the Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. §§ 668-

668d), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

Upon locating a dead, injured, or sick listed species initial notification must be made to the FWS's Law Enforcement Office, 4901 Paseo del Norte NE, Suite D, Albuquerque, New Mexico, 87113, telephone (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.

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.

Lesser Long-nosed Bat

- We recommend that the Federal action agencies work with us, Arizona Game and Fish Department (AGFD), and New Mexico Department of Game and Fish (NMDGF) to implement recovery actions for lesser long-nosed bat.

Mexican long-nosed bat

- We recommend that the Federal action agencies work with us, AGFD, and NMDGF to implement recovery actions for Mexican long-nosed bat.

Southwestern willow flycatcher

- We recommend that the Federal action agencies work with us, AGFD, and NMDGF to implement recovery actions for Southwestern willow flycatcher.

Northern Mexican Gartersnake

- We recommend that the Federal action agencies work with us, AGFD, and NMDGF to participate in recovery planning and implementation of conservation actions for northern Mexican gartersnake, particularly on efforts to remove harmful nonnative species from occupied northern Mexican gartersnake habitat.
- We recommend that Federal action agencies and Southline refrain from using erosion control products, such as wattles, that contain a mesh size of 0.5" (or 1.27 cm) within proposed critical habitat for the northern Mexican gartersnake. This mesh size has been documented in the literature as being associated with direct mortality, via entanglement, in numerous species of snakes, including those in the gartersnakes genus *Thamnophis*. Alternatively, please

consider using the smallest mesh size possible (<0.5") or preferably, products that do not contain any mesh- or net-like attributes near occupied northern Mexican gartersnake habitat.

Yellow-billed cuckoo

- We recommend that the Federal action agencies work with us, AGFD, and NMDGF to participate in recovery planning and implementation of conservation actions for yellow-billed cuckoo.

Pima Pineapple Cactus

- We recommend that the Federal action agencies coordinate with the Arizona-Sonoran Desert Museum in salvaging for their collection some individual cacti that cannot be relocated for some reason.

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

REINITIATION NOTICE

This concludes the conference for the Southline Transmission Project. You may ask the FWS 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 FWS 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 FWS 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 concludes formal consultation on the actions 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.

The FWS appreciates the Federal action agencies' and Western's efforts to identify and minimize effects to listed species from this project. For further information please contact Scott Richardson (x242). Please refer to consultation number 02EAAZ00-2014-F-0140 in future correspondence concerning this project.

Steven L. Spangle

cc: Field Supervisor, Fish & Wildlife Service, Phoenix, AZ (2 copies)
Jean Calhoun, Assistant Field Supervisor, Fish & Wildlife Service, Tucson, AZ
New Mexico Ecological Services Office, Albuquerque, NM (Attn: Patricia Zenone)
Tim Shannon, District Manager, Gila District, Bureau of Land Management, Tucson, AZ

Alexa Sandoval, Director, New Mexico Department of Game and Fish, Santa Fe, NM
Larry Voyles, Director, Arizona Game and Fish Department, Phoenix, AZ

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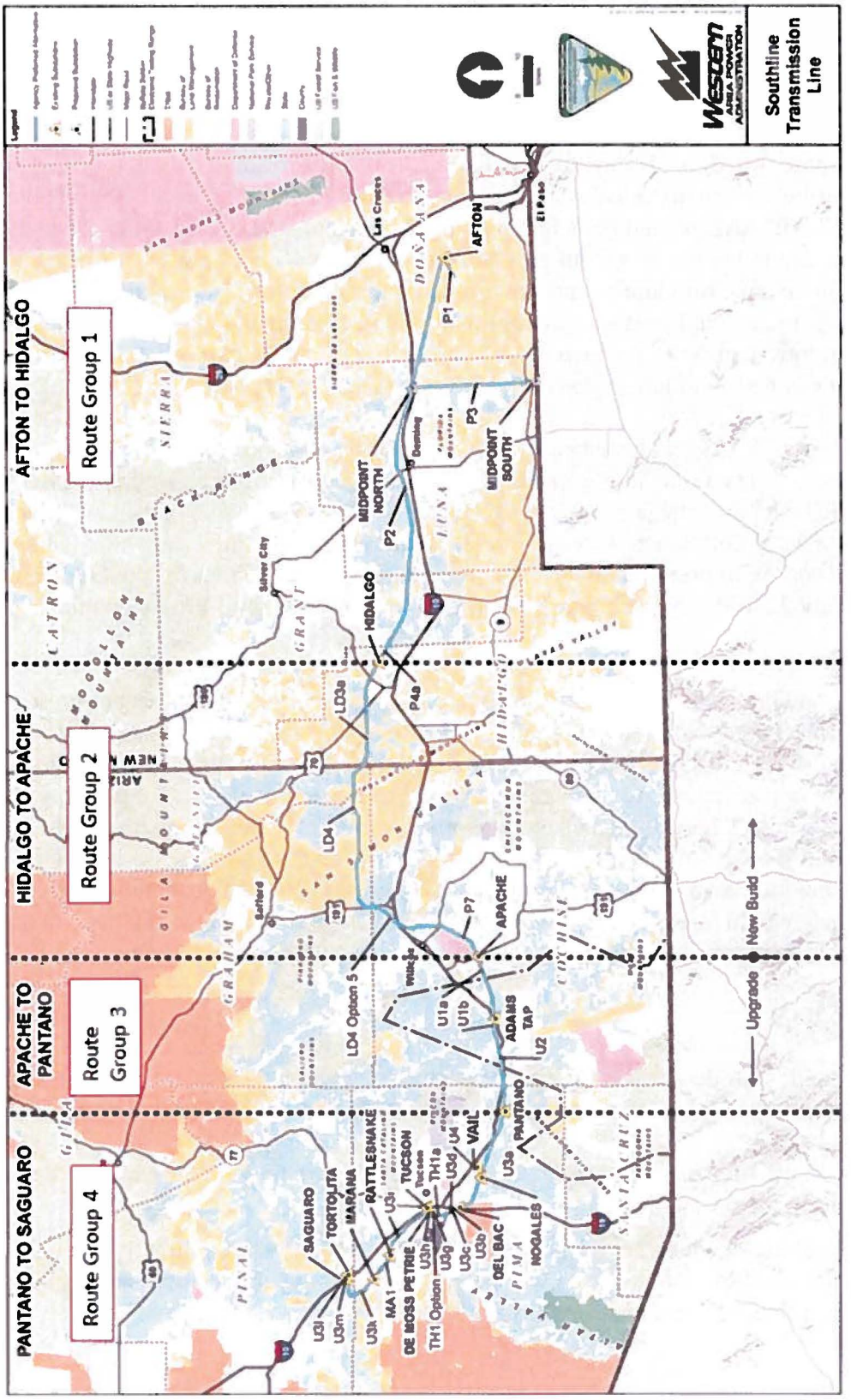
Figure 1. Action Area



Gila chub

We listed the Gila chub as endangered with critical habitat on November 2, 2005 (70 FR 66664). Historically, Gila chub were recorded from rivers, streams, and spring-fed tributaries throughout the Gila River basin in southwestern New Mexico, central and southeastern Arizona, and northern Sonora, Mexico. Today the Gila chub is restricted to small, isolated populations scattered throughout its historical range. Critical habitat includes approximately 160 miles of stream reaches in Arizona and New Mexico, organized into seven river units. Decline of the Gila chub is due to habitat loss from past and current dewatering of rivers, springs, and cienegas (e.g. from diversions, impoundments, and groundwater pumping), poor land management practices (e.g. excessive livestock grazing) resulting in erosion and arroyo formation, and the concomitant introduction of predacious and competing non-indigenous fish species. Life history information can be found in the final rule and references cited therein.

No species-specific surveys have been conducted for the Gila chub for the purposes of this proposed project. The Gila chub does not occur within the project area where it would cross the San Pedro River and Cienega Creek. Both the San Pedro River and Cienega Creek lack a permanent or semi-permanent water source at the proposed crossings and water is likely only present in response to precipitation events. Designated critical habitat for the Gila chub occurs approximately 2.5 miles downstream (north) of where the proposed Project would cross Cienega Creek.

No impacts on Gila chub individuals are anticipated because no individuals are present in the proposed project area. No ground disturbance would occur within Gila chub designated critical habitat because none occurs in the project or study areas. However, ground-disturbing activities as a result of construction and maintenance would occur on the banks, and possibly within 300 feet, of the Cienega Creek stream channel approximately 2.5 miles upstream of designated critical habitat. These ground-disturbing activities may result in an increase in erosion and sedimentation, indirectly impacting some of the PCEs of Gila chub designated critical habitat. These impacts would be temporary and minimal, and we expect that the quality and quantity of PCEs will return to pre-disturbance conditions and be maintained in the long-term.

CONCLUSION

We concur with your determination that the proposed action may affect, but is not likely to adversely affect, the Gila chub or its critical habitat. Our concurrence is based on the following:

1. There will no effect to individuals because none occur in the project area, and habitat does not occur in the project area.
2. Critical habitat downstream of the project area may be affected indirectly through actions in the project area, but these effects will be insignificant, and the quality and quantity of PCEs will return to pre-disturbance conditions.

Huachuca water-umbel

The Huachuca water-umbel was listed as an Endangered species in 1997 (62 FR 3),with critical habitat designated in 1999 (64 FR 37441). A total of 51.7 miles of critical habitat was designated at seven locations along streams and rivers in Cochise and Santa Cruz counties in Arizona. The nearest designated critical habitat for the species is approximately 12 miles south of the proposed project along the San Pedro River in Cochise County.

No species-specific surveys have been conducted for Huachuca water-umbel for the purposes of this proposed project. However, the only locations in the study area that could support the Huachuca water-umbel are at the proposed crossings over the San Pedro River and Cienega Creek (segments U2 and U3a). These proposed crossings lack a permanent or semi-permanent source of water and water is likely only present in response to precipitation events. The proposed crossings lack the perennial surface water required by the species. The nearest designated critical habitat for the species is approximately 12 miles south (upstream) of the proposed project along the San Pedro River in Cochise County.

The proposed project would not disturb habitat for the Huachuca water-umbel because none occurs in the project area. The proposed project would not occur in or near designated critical habitat; therefore, the proposed project would have no effect on designated critical habitat for the species.

CONCLUSION

We concur with your determination that the proposed action may affect, but is not likely to adversely affect, the Huachuca water umbel or its critical habitat. Our concurrence is based on the following:

1. Effects to individuals or habitat are discountable because none occurs in or near the project area.
2. Effects to critical habitat are discountable because the nearest critical habitat is approximately twelve mile upstream of the project area.

Appendix B - Conference Report – Northern Aplomado Falcon

Consultation History

- March 4, 2014 Biological assessment and request for conference received by Service from the BLM

Description of the Proposed Action

The proposed action is: for the BLM to issue a right-of-way grant to Southline Transmission, LLC (Southline) for the construction and operation of a 345 kV transmission line from the Afton Substation in New Mexico to the Apache Substation in Arizona (Figure1); for Western Area Power Administration (Western) to authorize and participate with Southline in the upgrade an existing Western transmission line and associated facilities from 115 kV to 230 kV from Apache Substation to Saguaro Substation in Arizona (BO Figure 1); for the U.S. Forest Service to authorize the upgrade of the Western line across Forest Service managed land in Cochise County, Arizona; and for the U.S. Bureau of Reclamation (Reclamation) to authorize the upgrade of the Western line across Reclamation managed lands in Pima and Pinal counties, Arizona. Because multiple Federal agencies have actions that are required by the project, this Conference Report evaluates all of these proposed actions and provides section 7 compliance for all of these agencies' actions. The BLM is acting as the lead action agency with regard to this conference.

The Southline Transmission Line Project (project) is a proposed electrical transmission line project that would consist of two sections. The first section would entail construction of approximately 240 miles of new double-circuit 345-kilovolt (kV) transmission line in a 200-foot right-of-way (ROW) between the Afton Substation, south of Las Cruces in Doña Ana County, New Mexico, and Western's Apache Substation, south of Willcox in Cochise County, Arizona (New Build Section). The second section would entail the upgrade of approximately 120 miles of Western's existing Saguaro–Tucson and Tucson–Apache 115-kV transmission lines to a double-circuit 230-kV transmission line in a 100-foot existing ROW (Upgrade Section). The Upgrade Section would originate at the Apache Substation and terminate at the Saguaro Substation northwest of Tucson in Pinal County, Arizona (BO Figure 1). Both new permanent ROW and temporary construction ROW would be required in the New Build Section and in some portions of the Upgrade Section for the transmission line, substations, access roads, and other permanent and temporary project components; the anticipated ROW width for the Upgrade Section 230-kV transmission line would be 150 feet. The proposed project would also include installation of new communications equipment, and connect to 14 substations distributed throughout southern New Mexico and Arizona, including expanding/upgrading existing substations and potentially constructing a new substation in Luna County, New Mexico. The proposed project would also include installation of new communications equipment to facilitate operations. The proposed action includes proponent committed environmental measures, best management practices (BMPs), and additional proposed species-specific conservation measures (BA Table 3-7, included herein by reference).

Conservation measures

AF-1: Preconstruction surveys would take place in habitat classified as moderate or high suitability for the northern aplomado falcon within the proposed ROW and a 1-mile buffer.

Surveys should be conducted several times from January 15 to June 30 in order to detect breeding activity.

AF-2: All existing raptor nests or other large nests found during preconstruction surveys would be preserved in place, if possible, or relocated if necessary. No relocation of active nests would occur, and no nests would be relocated until after consultation with the Federal action agencies and FWS.

AF-3: Construction would not take place within 1 mile of occupied northern aplomado falcon nests between January 15 and September 1. Aplomado falcons are frequently observed on their breeding territories in southern New Mexico in January. Therefore, January 15 is the start date for seasonal restrictions.

Status of the Species in the Action Area

Aplomado falcons in Arizona and New Mexico are part of a non-essential population (NEP) established in 2006 (71 FR 42298), and as such are subject to advisory conference with the USFWS under Section 7(a)(4) of the ESA rather than consultation under Section 7(a)(2), when outside of the National Park Service and NWR systems. No portion of the project would cross National Park or NWR lands; thus, conference rather than consultation is required for the aplomado falcon. Critical habitat is not designated for NEPs.

A broad area of northern aplomado falcon habitat occurs within the action area. For the purposes of analysis, all of the grassland vegetation types within the study area in route groups 1–3 (see Figure 1 in BO) were considered habitat for the northern aplomado falcon. No northern aplomado falcons have been seen in Arizona since an observation in Cochise County in 1977 (AGFD 2001a). Future recovery of the species may allow for dispersal into habitat in Arizona. In southern New Mexico, there are numerous sightings each year in a variety of locations, and breeding pairs were observed in 2013 and 2014.

Effects of the Action

The proposed project would result in temporary and permanent northern aplomado falcon habitat loss and degradation. The proposed project would disturb approximately 624 acres of habitat for the species. This would be approximately 23 percent of the 2,713 acres of habitat within the ROW and 0.5 percent of the approximately 114,089 acres of habitat within the study area. Areas of temporary disturbance would be restored; however, restoration in arid environments is difficult and slow and may require 50 to 100 or more years. As such, impacts from ground disturbance on northern aplomado falcon would be long-term. Habitat loss could reduce overall prey abundance; however, the species utilizes large home ranges which would reduce the potential effects of habitat loss and degradation on northern aplomado falcon prey species.

Conclusion

After reviewing the proposed action, with included conservation measures, we conclude the project is not likely to jeopardize the continued existence of the 10(j) non-essential, experimental population of northern aplomado falcon. Because of the northern aplomado falcon's status as a non-essential experimental population in New Mexico and Arizona, they are treated as proposed for listing for section 7 consultation purposes. By definition, a nonessential experimental population is not essential to the continued existence of the species. Thus, no proposed action impacting a population so designated could lead to a jeopardy determination for the entire species. With full implementation of the proposed conservation measures, the presence of large areas of available unoccupied habitat, and the naturally low densities of aplomado falcons, there should be only insignificant effects resulting from the proportionately small areas of habitat loss.

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Appendix C: Technical Guidance

Sonoran Desert Tortoise

Conservation measures for the Sonoran desert tortoise would include proponent proposed measures (see Appendix D Mitigation and Avoidance Measures) and:

DT-1: Pre-construction desert tortoise surveys would be conducted in suitable habitat. A worker education program including information on desert tortoises would be implemented. Any desert tortoises encountered during preconstruction surveys or during construction activities would be handled in accordance with the AGFD "Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects" (AGFD 2007).

In addition, we recommend that BLM and Western coordinate with the FWS prior to initiation of biological field work for the latest recommendations for Sonoran desert tortoise surveys and monitoring protocols.

Sprague's Pipit

Project-wide Mitigation and Avoidance Measures described in the BA would minimize ground disturbance and the potential for the establishment and spread of non-native grass and other invasive plant species within habitat for Sprague's pipit. We also recommend that Federal action agencies and the applicant minimize disturbance in all potential Sprague's pipit wintering habitat through use of existing access roads, avoid vegetation clearing, and avoid locating pull sites in potential habitat. Implementation of the Avian Protection Plan (APP) will further protect individual birds.

Literature Cited

Arizona Game and Fish Department (AGFD). 2007. *Guidelines for Handling Sonoran Desert Tortoises Encountered on Development Projects.* Accessed online at http://www.azgfd.gov/hgis/pdfs/Tortoisehandlingguidelines.pdf on January 23, 2014.

Appendix D: Mitigation and Avoidance Measures

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
Standard Mitigation				
The boundaries of construction activities would be predetermined and staked or flagged prior to any construction activity. No paint or permanent markings would be applied to rocks or vegetation.	X			
Prior to construction, all construction personnel would be instructed on the protection of cultural and ecological resources.	X			
All vehicle movement would be restricted to designated access, contracted acquired access, or public roads.	X	X	X	X
To limit disturbance, existing access roads would be used to the extent practicable, providing that doing so does not additionally impact resource values. Widening and grading of roads would be kept to the minimum required for access by Project construction equipment.	X	X	X	X
Structures and/or ground wire would be marked with high-visibility devices such as vibration dampers, where required by government agencies such as the FAA.	X	X	X	
Transmission line materials would be designed and tested to minimize audible noise, radio interference, electromagnetic interference (EMI), and television interference due to corona.	X	X	X	
No widening or upgrading of existing roads would be undertaken in the area of construction and operations, where soils and vegetation are sensitive to disturbance, in areas of critical habitat for vegetation or wildlife, in areas of habitat for BLM special status species, or where archaeological sites are present.		X	X	
During operation of the transmission lines, the ROW would be maintained free of non-biodegradable debris. Desert vegetation would be crushed in place to promote seeding and revegetation, and reduce erosion potential.			X	
BLM and Western road construction specifications would be followed where unimproved spur roads cannot be employed.		X	X	
Unimproved spur roads would be used to the extent practicable in areas where no grading would be warranted to access work areas, within the approved ROW. Unimproved spur roads would be used to access a site without specifically blading a road or significantly modifying the landscape. All vehicle movement would be restricted to designated access, even if that is unimproved access. Vegetation would be crushed, not cut. For all access types, soil would be compacted, but not removed.		X	X	X
Structures would be placed to avoid, and/or to allow conductors to span, sensitive features such as riparian areas, waterways, roads, trails, and cultural sites within limits of standard transmission line structure design. This would minimize the amount of sensitive features disturbed and/or reduce visual contrast.	X	X	X	

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource (Continued)

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
Clearing of trees in and adjacent to the ROW would be minimized to the extent practicable to satisfy conductor-clearance requirements (NESC and up to 10 years' timber growth). Trees and other vegetation would be selectively removed to blend the edge of the ROW into adjacent vegetation patterns, as appropriate.		X	X	
Separation between transmission lines and existing utilities, roads, and railroads would be minimized to the extent practicable. Opportunities to share portions of adjacent ROWs would also be explored.	X			
All construction vehicle movement would be restricted to predesignated access, contractor-acquired access, and public roads.		X		
The width of construction and new temporary access roads would be sited to keep to the minimum needed to avoid sensitive areas and to limit ground disturbance.		X		
Surface elevations would be returned to approximate pre-Project conditions, as practicable.		X		X
A WEAP would be prepared. All construction crews and contractors would be required to participate in WEAP training prior to starting work on the Project. The WEAP training would include a review of the special status species; WUS; riparian habitat; cultural, paleontological, and other sensitive resources that could exist in the project area; the locations of sensitive biological resources and their legal status and protections; and measures to be implemented for avoidance of these sensitive resources. A record of all trained personnel would be maintained during the construction period.	X	X		
The process by which the BLM, Western, and Southline and its construction contractor would conduct environmental monitoring, compliance, and reporting activities during construction would be described in a project compliance plan that would be prepared by the compliance inspection contractor (CIC) after they have been selected. After issuance of the notice to proceed, a CIC, designated by the BLM and Western, would provide environmental oversight and compliance monitoring during Project construction to ensure compliance with all design features and mitigation measures.	X	X		
Reclamation				
A Reclamation, Vegetation, and Monitoring Plan would be developed and implemented.		X	X	X
Reclamation would be accomplished with native species, unless otherwise approved.		X	X	X
Seeding would occur between November and March to ensure a greater chance of success. This would be tied to replacement of conserved topsoil with its natural seed stock.		X	X	X
Air Quality and Climate Change				
Project activities would be in compliance with all applicable Federal, State, and local laws and regulations concerning prevention and control of air pollution during construction and operation.		X	X	

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource (Continued)

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
An Erosion, Dust Control, and Air Quality Plan would prepared as part of the final POD. The plan would be developed and implemented to minimize and mitigate potential air quality and climate change impacts.	X	X	X	X
All necessary air quality permits would be obtained prior to construction or operating equipment that would result in regulated atmospheric or fugitive dust emissions.	X			
Dust control measures consistent with all applicable State or local standards, as outlined in the Erosion, Dust Control, and Air Quality Plan, would be implemented; these include the following reasonable precautions: 1) frequent watering (trucked in, no new water sources) or stabilization of excavations, spoils, access roads, storage piles, and other sources of fugitive dust (parking areas, staging areas, other) if construction activity causes visible emissions of fugitive dust beyond the work area; 2) reduction in the amount of disturbed area where possible; 3) planting of vegetative ground cover, as appropriate, in disturbed areas after construction activities have ended, and treatment of actively disturbed areas with BLM-approved dust palliatives.		X		
Trackout control devices such as grizzly bars, wheel washers, and gravel pads would be located at all entrances and exits.		X		
Haul-truck cargo beds would be covered with tarps and travel speeds would be limited to no more than 15 miles per hour on unpaved roads.		X		
Combustion emissions from mobile sources would be minimized by proper maintenance and tune-up of equipment.		X	X	
To reduce the potential for greenhouse gas emissions, only properly trained Project personnel would handle sulfur hexafluoride, and a sulfur hexafluoride recovery and recycling program would be implemented.		X	X	X
Cultural Resources				
Cultural resources would continue to be considered during post-EIS phases of work. Specific cultural resource inventory, protection, and mitigation measures to be employed would be outlined in the Project-specific Programmatic Agreement, in accordance with Section 106 of the NHPA. The final POD would include the signed Programmatic Agreement.	X	X	X	X
The area of potential effects will be defined, consisting of the approved alternative corridor and all areas and ancillary features that sustain ground disturbance (access roads, construction yards, etc.) will be subject of 100% pedestrian cultural resources survey in order to identify all cultural resources that may be adversely impacted by the Project. Survey and reporting requirements would follow BLM Handbook 8110 and 8111 requirements for a Class III Intensive Field Survey (BLM 2004).	X			

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource (Continued)

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
An HPTP would be developed and implemented to avoid, minimize, and mitigate the adverse effects of the Project on known cultural resources. Mitigation measures may range from avoidance and preservation in place to data recovery excavations conducted before the destruction of a site if avoidance is not a feasible option. The HPTP would include a monitoring and discovery plan detailing procedures to be followed in the inadvertent discovery of a potentially significant archaeological site or human remains.	X	X	X	
To the extent practical, all ground-disturbing activities and other Project components would be micro-sited to avoid or minimize impacts on cultural resources listed as or potentially eligible for listing as, unique archaeological sites, historical resources, or historic properties.	X	X		
Before construction, and as described in the WEAP, Southline and its construction contractor would provide cultural resources sensitivity training to all construction personnel so that Project personnel understand the procedures in the monitoring and discovery portion of the HPTP.	X			
Hazardous Materials and Waste				
Several framework plans prepared as part of the final POD would be developed and implemented to minimize and mitigate potential hazardous materials and waste; plans include SWPPP, SPCC, Soil Management, and Hazardous Materials Management. These plans would include requirements by the EPA, OSHA, Arizona Department of Environmental Quality, and the New Mexico and Arizona Departments of Transportation.	X	X	X	X
The SWPPP would include BMPs to address the storage and handling of hazardous materials and sediment runoff during construction activities to minimize the risk of an accidental release. The SWPPP is required by, and enforced by, the EPA in New Mexico, and the Arizona Department of Environmental Quality in Arizona.	X	X	X	
All construction, operation, and maintenance crew members would be properly trained to deal with a spill, and appropriate spill containment material would be on hand at every work site. Careful handling and designation of specific equipment repair and fuel storage areas, as outlined in the SPCC Plan, would reduce the potential for oil and fuel spills. In the event that there is an oil or fuel spill, immediate measures would be taken to control the spill, and the BLM, National Response Center, and/or Arizona Department of Environmental Quality or New Mexico Environment Department would be notified immediately as defined in the SPCC Plan.	X	X	X	X
The Soil Management Plan would provide guidance for the proper handling, on-site management, and disposal of contaminated soil, if encountered during construction, operation, and maintenance activities. Appropriately trained personnel would be on-site during preparation, grading, and related earthwork activities to monitor the soil conditions encountered.	X	X	X	X

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource (Continued)

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
The Project-specific Hazardous Materials Management Plan and program would outline proper hazardous materials use, storage, and transport requirements and applicable handling procedures. EPA procedures for handling and storage of hazardous materials, OSHA requirements for proper storage and labeling on the job site, and New Mexico and Arizona Department of Transportation requirements for transportation of hazardous materials would be followed.	X	X	X	X
Personnel, contractors, and transporters involved with hazardous materials management would be required to comply with Federal and State regulations established for the transportation, storage, handling, and disposal of hazardous substances, materials, and wastes. "Hazardous material" means any substance, pollutant, or contaminant that is listed as hazardous under the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended.		X	X	X
New or expanded substation locations that involve the purchase or long-term leasing of land, purchased transmission line ROWs, and any other property to be acquired would be screened for environmental liabilities. The degree and level of screening would be based on knowledge or information available on the property to determine the probability of contaminants of concern or other environmental impairment. A Phase I Environmental Site Assessment would be conducted if preliminary screening indicates a reasonable risk that such environmental conditions may exist on the property and the property continues to be targeted for acquisition by the Project, consistent with American Society for Testing and Materials Standard E1527-05.	X			
In the event of a spill, workers in the immediate area would cease work, begin spill cleanup operations, and notify appropriate agencies as required by law and specified in the SPCC Plan. Southline and its construction contractor is responsible for cleanup and assumes liability for any and all releases of hazardous substances disposed on public land, in accordance with State, Federal, and local laws and regulations. Southline would immediately notify the BLM authorized officer of any and all releases of hazardous substances on public land.		X	X	X
If backfill material to be used is derived from a site that could possibly have contamination, it would be sampled and determined to be free of regulated contaminants before it is used to fill excavations. The results of any tested soils should be shared with the appropriate surface managing agency. No contaminated soils would be used as fill material for the Project.		X		
All construction and demolition waste, including trash and litter, garbage, and other solid waste, would be removed and transported to an appropriately permitted recycling or disposal facility. Southline and its construction contractor would prepare a construction waste disposal plan for all nonhazardous wastes generated during construction of the Project. The plan would contain a description of all nonhazardous solid and liquid construction wastes, recycling plans, and waste management methods to be used for each type of waste.		X		X
Southline or the applicable contractors would maintain all vehicles in good working order. Equipment would be properly tuned and maintained to avoid leaks of fluids.		X	X	X

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource (Continued)

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
Service and refueling procedures would not be conducted within 500 feet of a seep, wash, or other water body. Routine service of any vehicles or equipment would not be done within the ROW.		X	X	X
Health and Human Safety				
The HASP and Fire Protection Plan prepared as part of the final POD would be developed and implemented to minimize and mitigate potential health and human safety impacts. Southline and its contractors would work with the appropriate surface managing agencies to incorporate any fire restrictions that are put into effect during construction, operation, and decommissioning of the project.	X	X	X	X
The HASP would address potential situations that workers could encounter during construction and maintenance. The purpose and goal of the worker safety and environmental training would be to communicate Project-related environmental and safety concerns and appropriate work practices to all field and construction personnel prior to the start of construction, including spill prevention, emergency response measures, accident prevention, use of protective equipment, medical care of injured employees, safety education, and fire protection. Training would encompass environmental training related to road designations and speed limits, promote "good neighbor" policies, and institute BMPs for construction. The training would emphasize site-specific physical conditions to improve hazard prevention in accordance with OSHA requirements (29 CFR 1910).	X	X	X	
Southline and its construction contractor would locate overhead and underground utilities that may reasonably be expected to be encountered during construction. If a utility service interruption is known to be unavoidable, Southline and its construction contractor would coordinate with the service provider to notify members of the public, the jurisdiction, and the service providers affected by the interruption via letters and newspapers notices published no later than 7 days prior to the first interruption. Copies of the notices would be provided to the BLM and Western following notification.	X	X		
All permanent metallic objects within the Project's transmission line ROWs would be grounded in accordance with industry standards.	X	X	X	
Farmlands and Grazing				
Fences and gates would be repaired or replaced to their original, predisturbed condition (or better), as required by the landowner, BLM authorized officer, or other land managing entity if they are damaged or destroyed by construction activities. New temporary and/or permanent gates would be installed only with the permission of the landowner or the BLM. Temporary gates not required for postconstruction access control would be removed following construction completion and in accordance with the POD.		X		X

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource (Continued)

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
Water facilities (e.g., tanks, developed springs, water lines, wells, etc.) would be repaired or replaced to their predisturbed condition if they are damaged or destroyed by construction, operation, or maintenance activities, as required by the landowner of land management agency. Temporary watering facilities would be provided for wildlife and livestock until permanent repair or replacement is complete.		X	X	X
On agricultural land, ROWs would be aligned, in so far as practicable, to reduce the impact to farm operations and agricultural production. This would typically be done in conjunction with negotiating ROW agreements with landowners.	X	X		
Military Operations				
The transmission line operator would work with Buffalo Soldier Electronic Testing Range (BSETR) to coordinate, and possibly limit, interconnections to the proposed Project to the extent allowed by the Federal Energy Regulatory Commission.	X			
Southline and Western would work with BSETR to identify micro-siting opportunities during Project design.	X			
The transmission line operator would coordinate with BSETR during the design phase of the proposed Project to limit EMI. The proposed Project would be constructed using the best available construction techniques and technology (i.e., use of grounding, selective conductor type and arrangement, and conductor surface gradients), to the extent feasible and reasonably economical, in order to minimize EMI.	X			
The transmission line operator would coordinate with BSETR to allow for an updated measure of the "floor value" of the proposed Project, once the proposed line is energized. Such cooperation could include provision of real-time operating and load information to BSETR to help calibrate the floor value of EMI.	X	X	X	
The transmission line operator would coordinate with BSETR to develop reporting standards, for potential inclusion in the transmission line maintenance and inspection program, to the extent allowable by the Federal Energy Regulatory Commission. While normal inspection maintenance would take care of typical EMI issues, specific incidents such as storm damage or vandalism would need to be responded to outside of the normal maintenance cycle. If not detectable through transmission line monitoring, the operator would need to hear from someone experiencing interference in order to respond.	X	X	X	
The transmission line operator would coordinate planned outages (curtailment of power line operations for BSETR to implement testing) with BSETR to the extent feasible in order to meet necessary contractual commitments, utility mandates, laws and regulations, and power system requirements. The operator is very limited in the timing and duration of potential outages; outages stress the rest of the system, which can cause system failures.	X		X	

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource (Continued)

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
Noise				
Construction would comply with local noise ordinances. There may be a need to work outside the local ordinances to perform work during available line outage windows in order to take advantage of low electrical draw periods during nighttime hours. The construction contractor would comply with variance procedures required by local authorities.		X		
Construction equipment would be maintained in good working order in accordance with manufacturer's recommendations.		X		X
Idling of construction equipment and vehicles would be minimized during construction.		X		
Workers would be provided with appropriate hearing protection, if necessary, as described in the HASP.		X	X	X
Paleontology				
In consultation with appropriate land management agencies, Southline and its contractor would participate in the preparation of a Monitoring Plan, paleontological surveys, personnel education, monitoring ground disturbance for fossils, curation of fossils, and deposition of fossils in a paleontological repository, as necessary in areas of highest likelihood of encountering resources.	X	X		
If significant fossils are encountered during construction, construction activities would be temporarily diverted away from the discovery. The monitor would notify all concerned parties and collect matrix for testing, processing, and documentation, as directed by the authorized officer of the BLM.		X		
Recreation				
Southline and its contractor would coordinate with the BLM to display appropriate "closed" signage at the entrance to new spur roads to structure locations and access roads located on BLM-managed lands. This includes temporary signs during the construction phase of the Project and permanent signs and/or vehicle barriers that would close the spur routes to public travel during the operational phase. Signs would be removed as appropriate upon decommissioning.	X	X	X	X
If temporary short-term closures to recreational areas are necessary for construction activities, Southline and its contractor would coordinate those closures with recreational facility owners. To the extent practicable, Southline and its construction contractor would schedule construction activities to avoid heavy recreational use periods (e.g., holidays or tournaments). Southline and its construction contractor would coordinate with the facility owner to post notice of the planned closure on-site 14 calendar days prior to the closure.	X	X	X	X

If the Arizona National Scenic Trail must be temporarily closed during construction, an alternate trail route (detour) would be provided during the closure. If it is necessary for trail users to leave the trail during the temporary closure, trail users would need to obtain permission from the ASLD.	X	X		X

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource (Continued)

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
Soils				
As appropriate and feasible, Southline and its construction contractor would implement topsoil segregation and conservation practices at substation sites and as directed by the BLM and Western.		X		
In construction areas (i.e., temporary use areas, structure sites, access roads, etc.) where grading is required, surface restoration would be implemented as required by the landowner or BLM authorized officer. The method of restoration would normally consist of returning disturbed areas back to their normal contour, replacing topsoil, reseeding (where required), installing cross drains for erosion control, placing water bars in the road, and filling ditches. The Reclamation, Vegetation, and Monitoring Plan would include final details on the details of restoration.		X		
Transportation				
Prior to the start of construction, Southline and its construction contractor would prepare a Traffic and Transportation Management Plan for the Project to address the timing and routing of Project trips in an effort to minimize Project impacts on local streets, highways, and railroad operations.	X			
At least 90 days prior to any helicopter use on the Project, Southline and its construction contractor would coordinate with the FAA for review and approval of plans for any helicopter flights that would take place during construction and operation. Southline and its construction contractor would then provide information to the BLM and Western regarding the intended need and use of helicopters during construction and operation of the Project, including the Flight and Safety Plan; the estimated number of days and hours that the helicopter would operate; the type and number of helicopters that would be used; the location, size, and number of staging areas for helicopter takeoffs and landings; and written approval from property owners for use of helicopter staging areas.	X	X	X	
Transmission structures would be identified with high-visibility markers in areas where they intersect or parallel military training routes.			X	
Gates and fencing would be provided in areas where off-highway-vehicle use would be restricted due to military operations, or to protect sensitive resources.		X	X	X
Vegetation				

Preconstruction native plant inventories and surveys for noxious weed species as stipulated by the appropriate land managing agency would be conducted once transmission line centerline, access road, and transmission line structure sites have been located.	X	

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource (Continued)

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
Every effort would be made to minimize vegetation removal and permanent loss at construction sites to the extent practicable. Access would not be graded unless necessary for erosion control or other engineering reason. Final structure and spur road locations would be selected to avoid sensitive vegetation to the greatest extent feasible.		X		
In construction areas where grading is not required, vegetation would be left in place wherever possible, and original contours would be maintained to avoid excessive root damage and allow for regrowth. All existing roads would be left in a condition that is equal to or better than their condition before the construction of the transmission lines, as determined by the appropriate land managing agency.		X		
Southline and its construction contractor would develop a Reclamation, Vegetation, and Monitoring Plan that would guide restoration and revegetation activities for all disturbed lands associated with construction of the Project and its eventual termination and decommissioning. The plan would address all land disturbances, regardless of ownership. It would be developed in consultation with appropriate agencies and landowners and would be provided to these entities for review and concurrence. The plan would provide details on topsoil segregation and conservation, vegetation treatment and removal, salvage of appropriate species, and revegetation methods, including use of native seed mixes, application rates, transplants, and criteria to monitor and evaluate revegetation success.	X	X	X	X
Special status plants, including the Pima pineapple cactus, would be avoided. Where avoidance is not possible, special status plants would be conserved by relocating plants and/or reseeding, replacing topsoil with existing topsoil that was removed, and regrading in compliance with local ordinances (Pima County). Measures to conserve special status plants would be implemented through the Reclamation, Vegetation, and Monitoring Plan.	X	X		X
Removal of riparian scrubland vegetation would be avoided where possible. Natural regeneration of native plants would be supported by selectively cutting vegetation with hand tools, mowing, trimming, or using other removal methods that allow root systems to remain intact.		X	X	X
Southline and its construction contractor would provide training to all personnel working in the project area to identify noxious weeds and prevent spread. Training would discuss known invasive and noxious weed species, known locations, identification methods, and treatment protocols. Training materials and a list of Project personnel completing the course would be provided to the BLM and Western.		X		
In consultation with local BLM field offices and local resource agencies, Southline and its construction contractor would develop and implement a Noxious Weed Management Plan.	X	X	X	X
Invasive and noxious weed populations would be mapped and reported to BLM/Western. BLM and Western will determine in which areas vehicle washing would be required, based on the results of the invasive/noxious weed surveys.	X	X		

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource (Continued)

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
As required, equipment would be cleaned before ingress to minimize the potential for the spread of invasive species. These details would be described in the Noxious Weed Management Plan. Buffelgrass would be specifically addressed in the plan, which would outline efforts to eliminate it from within areas disturbed by the proposed Project to ensure that it does not spread to adjoining lands.	X	X	X	X
Visual Resources				
In order to restore disturbed areas to an appearance that would blend back into the overall landscape, seeding and/or planting would be conducted in any area that has been cleared or disturbed during construction. Seed mix would be tailored to an area's soil type, existing vegetation, and native species.		X		X
The Project would incorporate nonspecular conductors into the Project design to decrease reflectivity and visibility of Project features, where specified by the BLM authorized officer.	X	X		
Non-transmission line structures such as operations and maintenance buildings, microwave equipment buildings, regeneration structures, emergency generators, and other associated structures would be treated or painted with non-reflective, flat-toned surface treatment. The color of the structures would be painted in earth tones or in a color designed to reduce color contrasts with the surrounding landscape. A dark, neutral color, such as the BLM Standard Environmental Color, "Carlsbad Canyon," or similar is recommended because the hue tends to blend into desert landscape at varying distances.		X	X	
"Dulled" metal or self-weathering finish structures would be used to reduce visual impacts, if specified by the BLM authorized officer.	X	X		
The alignment of any new access roads (including unimproved spur roads) would stay within the designated access ROW and would follow the designated area's landform contours and avoid steep areas as much as feasible, provided that such alignment does not additionally impact resource values. This would minimize ground disturbance and/or reduce scarring (visual contrast).	X	X		
Aerial markers or warning lights would be required for conductors or structures, in keeping with FAA, U.S. Customs and Border Protection, and Department of Defense regulations for structures over 130 feet. The use of red strobe lighting would reduce potential impacts from artificial night lighting and would reduce impacts from night brightness and viewing of night skies. The minimum number and intensity of lights would be used, given that the tallest structures are under the 200-foot FAA requirement (FAA Advisory Circular 70/7460-1K (FAA 2007)). Exterior lights installed on conductors or other facilities would be aviation warning lights, or FAA L-864 aviation red-colored flashing lights with 20 to 40 flashes per minute standard flashing range.		X	X	

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource (Continued)

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
Water Resources				
A Project-specific construction SWPPP would be prepared prior to the start of construction of the transmission line and substations in compliance with CWA Section 402, if required. The SWPPP would use BMPs to address the storage and handling of hazardous materials and sediment runoff during construction activities to minimize the risk of an accidental release. As part of the SWPPP, soil disturbance at structure construction sites and access roads would be the minimum necessary for construction and would be designed to prevent long-term erosion, through activities such as restoration of disturbed soil, revegetation, and/or construction of permanent erosion control structures. A Department of the Army permit application would be prepared prior to the start of construction of the transmission line and substations for the discharge of dredged or fill material in compliance with CWA Section 404, if required. Activities in and around streams and wetlands would be designed to avoid, minimize, and mitigate impacts to WUS.	X	X		
Roads would be built as close as possible to right angles to the streams and washes. Culverts or temporary bridges would be installed where conditions warrant. All construction and operations activities shall be conducted in a manner that would minimize disturbance to vegetation, drainage channels, and intermittent or perennial stream banks.		X		
To the extent practicable, structures would be sited with a minimum distance of 200 feet from streams.	X			
Construction equipment would be kept out of flowing stream channels. Structures would be located to avoid active drainage channels, especially downstream of steep slope areas, to minimize the potential for damage by flash flooding and mud and debris flows.	X	X		X
Flood control devices would be located where required to protect structures or other Project structures from flooding or erosion. Appropriate design of structure foundations would be used to prevent scour or inundation by a 100-year flood to avoid disturbed areas. The locations of transmission structures would be designed to avoid steep, disturbed, or otherwise unstable slopes. If drainages cannot be avoided by structure placement, Southline and its construction contractor would design drainage crossings to accommodate estimated peak flows and ensure that natural volume capacity can be maintained throughout construction and upon postconstruction restoration.	X	X		
Wildlife				
In consultation with the BLM and Western, Southline and its construction contractor would prepare and implement a Biological Monitoring Plan prior to issuance of a notice to proceed and prior to construction that would specify the level of biological monitoring to be provided throughout construction activities in all construction zones with the potential for presence of sensitive biological resources. The number of monitors and monitoring frequency would be specified for each work zone.	X	X		

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource (Continued)

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
Preconstruction surveys would be required in areas where Sonoran desert tortoise (now a separate species: Morafka's desert tortoise (*Gopherus morafkai*)), Gila monster, and Tucson shovel-nosed snake are expected to occur. In consultation with the BLM and Western, Southline and its construction contractor would hire qualified biologists to conduct preconstruction surveys in ground disturbance areas within suitable habitat for appropriate special status species.	X			
To reduce impacts on the Sonoran (Morafka's) desert tortoise, known to exist in the western portion of the project area, only authorized biologists with a valid Arizona Game and Fish Department (AGFD) permit would handle desert tortoises if encountered within the project area, following the most current desert tortoise handling guidelines published by the AGFD.		X		X
Preconstruction surveys for species listed under the ESA or specified by the appropriate land management agency as sensitive or of concern would be conducted in areas of known occurrences or suitable habitat. Timing of the surveys would be determined by FWS approved species-specific survey protocol.	X			
Monitoring of construction activities would be required in some areas to ensure that effects on these species are avoided during construction. If bald eagle or golden eagle nests are identified during preconstruction surveys, seasonal restrictions on construction within a specified buffer would be implemented where applicable, according to FWS protocols, to comply with the Bald and Golden Eagle Protection Act. Preconstruction nesting-season surveys for migratory birds and surveys for burrowing owls in suitable habitat would be conducted as needed to comply with the Migratory Bird Treaty Act.		X		
Surveys for bat roosts would be conducted within 0.25 mile of the Project ROW in areas that potentially contain caves, karst features, or mines. Occupied bat roosts would be avoided.	X			
Access roads in Tucson shovel-nosed snake habitat would be posted closed to off-road-vehicle use and gated if appropriate to decrease the potential for vehicles striking the subspecies.		X	X	
Where appropriate, protective drift fencing would be placed along access roads and disturbance areas in suitable Tucson shovel-nosed snake habitat during the active season of the snake to limit the potential for vehicle strikes.		X	X	
In Tucson shovel-nosed snake habitat, temporarily disturbed areas will be revegetated with native shrubs, grasses, and forbs to reduce impacts on habitat for prey populations of the Tucson shovel-nosed snake.		X		X
Tucson shovel-nosed snake identification and avoidance measures would be included in the worker training program. If during construction activities Tucson shovel-nosed snakes are discovered in or near areas being disturbed, biological monitors would be required to be present on-site during construction activities.	X	X		

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource (Continued)

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
To reduce impacts on migratory birds and raptors, especially near the Willcox Playa: 1) Southline and its construction contractor would consult with the appropriate agencies (BLM or FWS) on a case-by-case basis when active nests are found in project areas, unless directed to do otherwise by these same agencies; 2) active bird nests would not be moved during breeding season, in compliance with the Migratory Bird Treaty Act, unless the Project is expressly permitted to do so by the FWS or BLM, depending on the location of the nest; 3) all active nests and disturbance or harm to active nests would be reported to the FWS or BLM, upon detection; and 4) work would halt if it is determined that active nests would be disturbed by construction activities, until further direction or approval to work is obtained from the appropriate agencies.	X	X		
Clearing, grubbing, blading, and access road improvements occurring within identified sensitive areas would be conducted outside the breeding season for most desert-nesting migratory birds.	X	X		
Construction holes left open overnight would be appropriately fenced or covered to prevent damage to wildlife or livestock.		X		
To reduce impacts on golden eagles and other raptors, Southline and its construction contractor would develop and implement an APP, in coordination with the BLM and Western for approval. The plan would be prepared in accordance with guidance provided by the FWS and in consultation with best practices such as the "Suggested Practices for Avian Protection on Power Lines" (APLIC 2006).	X	X	X	X
Southline and its construction contractor would follow Pima County guidelines for surveys prior to disturbance in priority conservation areas located in Pima County for western burrowing owls.	X	X		
Final structure and spur road locations would be adjusted to avoid sensitive wildlife resources to the greatest extent feasible.	X	X	X	
Additional Avoidance and Mitigation Measures for Special Status Species				
Lesser long-nosed bat and Mexican long-nosed bat				
All paniculate agaves (*Agave palmeri*, *A. parryi*, and *A. chrysantha*) and saguaros (*Carnegiea gigantea*) would be inventoried within the proposed ROW, and the potential to avoid or salvage each plant would be assessed. The priority would be avoidance when feasible.	X			
All suitable (e.g., healthy, undamaged, not flowering) paniculate agaves that could not be avoided would be salvaged using methods approved by the BLM/Western and FWS, but larger agaves would be given preference for avoidance when feasible. Plants salvaged from areas of permanent disturbance would be used to reclaim areas of temporary disturbance, or replanted outside disturbed areas if necessary.	X	X		

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource (Continued)

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
Saguaros less than 15 feet in height would be salvaged, unless prevented by site-specific conditions or poor plant health. Plants salvaged from areas of permanent disturbance would be used to reclaim areas of temporary disturbance, or replanted outside of disturbed areas if necessary. Larger saguaros would be avoided whenever feasible, but would be topped or removed if necessary.	X	X		
Agave and saguaro salvage would be augmented, as necessary, within 3 years after completion of initial restoration activities. Augmentation would occur within the ROW in areas of higher value to bats (e.g., in the vicinity of active roosts, within areas of high concentration agaves) to achieve a goal of no net loss of forage plants. Stocks from local sources or approved nursery-grown plants would be used.	X	X		
Salvaged plants would be monitored following reclamation for a period of 3 years, as described in the POD. Supplementary water would be provided, if monitoring indicates that rainfall is insufficient to achieve the goal of no net loss of forage plants. Plant survival through the monitoring period would be reported annually to the BLM/Western and FWS.		X	X	
Northern Aplomado Falcon				
Preconstruction surveys would take place in habitat classified as moderate or high suitability for the northern aplomado falcon within the proposed ROW and a 1-mile buffer.	X			
All existing raptor nests or other large nests found during preconstruction surveys would be preserved in place, if possible, or relocated if necessary. No relocation of active nests would occur, and no nests would be relocated until after consultation with the BLM and FWS.	X	X		
Construction would not take place within 1 mile of occupied northern aplomado falcon nests between February 1 and September 1.		X		
Yellow-billed Cuckoo				
All non-emergency Construction and maintenance in riparian woodlands at the San Pedro River, Cienega Creek, and the Santa Cruz River would take place between September 15 and March 1, to avoid disturbance of yellow-billed cuckoos.		X	X	
Line marking devices would be placed at the proposed crossings of the San Pedro River and Cienega Creek to minimize the potential for avian collisions with transmission lines.		X		
Southwestern Willow Flycatcher				
All non-emergency construction and maintenance in riparian woodlands at the San Pedro River, Cienega Creek, and the Santa Cruz River would take place between September 15 and March 1, to avoid disturbance of southwestern willow flycatchers		X	X	
Line marking devices would be placed at the proposed crossings of the San Pedro River, Cienega Creek, and the Santa Cruz River to minimize the potential for avian collisions with transmission lines.				
Pima Pineapple Cactus				

For Pima pineapple cactus that cannot be avoided, Southline will purchase credits in an FWS-approved conservation bank for Pima pineapple cactus, corresponding to the area of permanent disturbance to occupied habitat. Alternative, Southline may purchase suitable mitigation lands within Pima County's Pima pineapple cactus priority conservation areas.		X	X	

Table 3-7. Mitigation and Avoidance Measures for Environmental Protection by Resource (Continued)

Measures by Resource	Preconstruction	Construction	Operation and Maintenance	Decommissioning
Any Pima pineapple cactus that are not within the area of permanent disturbance but are present within the Project vicinity shall be flagged by a qualified biologist prior to the commencement of work to avoid accidental damage during construction.	X	X		
Plant species protected under the Arizona Native Plant Law (cactus, yucca, and native trees) shall be avoided to the extent practicable during construction. If impacts to native plants cannot be avoided, the plants shall be treated in accordance with state law. All Pima pineapple cactus within the area of permanent disturbance shall be salvaged and replanted on Conservation Lands north of the substation footprint by a biologist with previous experience transplanting Pima pineapple cactus. Transplantation would be accomplished in accordance with the cactus transplantation methodology described by the University of Arizona (2009).	X	X		
Prior to construction, protocol-level surveys for Pima pineapple cactus shall be conducted to identify any individuals that could be affected by construction activities. These surveys would be limited to areas of suitable habitat that could be disturbed by construction and maintenance activities.	X			