United States Department of the Interior

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In reply refer to:
AESO/SE
02EAAZ00-2018-F-0945

March 4, 2019

Mr. Tom Torres, Deputy Forest Supervisor
Tonto National Forest
U.S. Forest Service
2324 East McDowell Road
Phoenix, AZ 85006

RE: Vegetation Management and Line Maintenance in APS Power Line Rights-of-Way on Arizona Forests

Dear Mr. Torres:

Thank you for your request for formal consultation/conference with the U.S. Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. § 1531-1544), as amended (Act). We received your May 10, 2018, the same day. At issue are effects that may result from the ongoing Maintenance of Utility Corridors on the Apache-Sitgreaves, Coconino, Kaibab, Prescott, and Tonto National Forests within Arizona Public Service (APS) right-of-ways (ROW).

The proposed action may affect the endangered southwestern willow flycatcher (*Empidonax traillii extimus*) and its critical habitat, the threatened Mexican spotted owl (*Strix occidentalis lucida*) and its designated critical habitat, the threatened yellow-billed cuckoo (*Coccyzus americanus*), the threatened narrow-headed gartersnake (*Thamnophis rufipunctatus*), the threatened northern Mexican gartersnake (*Thamnophis eques megalops*), and the gartersnakes proposed critical habitats.

In your letter, you requested our concurrence that the proposed action "may affect, but is not likely to adversely affect" the endangered loach minnow (*Tiaroga cobitis*), spikedace (*Meda fulgida*), razorback sucker (*Xyrauchen texanus*), Gila chub (*Gila intermedia*), and their designated critical habitats; the endangered Gila topminnow (*Poeciliopsis occidentalis occidentalis*), desert pupfish (*Cyprinodon macularius*), Gila trout (*Oncorhynchus gilae*), ocelot (*Leopardus pardalis*), Arizona cliffrose (*Purshia subintegra*), and Arizona hedgehog cactus (*Echinocereus triglochidiatus var. arizonicus*); and, the endangered California condor (*Gymnogyps californianus*), Colorado pikeminnow (*Ptychocheilus lucius*), and Mexican gray

wolf (*Canis lupus baileyi*) (outside of their non-essential experimental boundaries). You similarly concluded the proposed project is not likely to adversely affect the threatened Chiricahua leopard frog (*Lithobates chiricahuensis*) and its designated critical habitat, the threatened Apache trout (*Oncorhynchus gilae apache*), and Little Colorado spinedace (*Lepidomeda vittata*). We concur with your determinations. Appendix A contains the basis for our concurrences, including species-specific conservation measures identified in the proposed action.

Additionally, you asked us to concur with your determination that the proposed action is not likely to jeopardize the experimental non-essential populations of the California condor, Colorado pikeminnow, and Mexican gray wolf. Appendix B contains these concurrences.

We based this biological opinion/conference opinion (BO/CO) on information provided in the April 16, 2018 biological assessment (BA), telephone conversations, and other sources of information. Literature cited in this BO/CO is not a complete bibliography of all literature available on the species of concern, and its effects, or on other subjects considered in this opinion. A complete record of this consultation is on file at this office.

Consultation History

- July 17, 2008: The Service issued a BO to the Forest Service on the Phase II Utility and Corridor Maintenance in Arizona Forests.

- December 19, 2012: The Forest Service reinitiated consultation with the Service on the Phase II Utility and Corridor Maintenance for loach minnow, spikedace, Chiricahua leopard frog, and southwestern willow flycatcher critical habitat designations.

- June 11, 2013: The Service issued a BO to the Forest Service on the Phase II Utility and Corridor Maintenance in Arizona Forests for designated critical habitat.

- March 29, 2016: The Service received the Forest Service's Phase II maintenance project BA to reinitiate consultation for New Mexico meadow jumping mouse (*Zapus hudsonius luteus*), narrow-headed gartersnake, northern Mexican gartersnake, their proposed critical habitats, and the then proposed roundtail chub (*Gila robusta*) for Western Area Power Administration (WAPA) and Navopache Electric Co-op (NEC).

- November 9, 2016: The Service issued a concurrence to the Forest Service on the Phase II Utility and Corridor Maintenance in Arizona Forests for the newly listed and proposed species and proposed critical habitat for WAPA and NEC.

- November 27, 2017: The Service received the Forest Service's Phase II maintenance project BA to reinitiate consultation for the narrow-headed and northern Mexican gartersnakes and their proposed critical habitats for Arizona Public Service (APS) and Salt River Project (SRP).

- May 10, 2018: The Service received the Forest Service's Vegetation management and line maintenance in APS power line rights-of-way on Arizona forests project BA.

- May 24, 2018: The Service issued a BO to the Forest Service on the Phase II maintenance project BA to reinitiate consultation for the narrow-headed and northern Mexican gartersnakes and their proposed critical habitats for Arizona Public Service and Salt River Project.

- September 13, 2018: The Forest Service granted an extension to provide a draft BO/CO the week of October 8, 2018.

- October 12, 2018: The Forest Service granted an extension to provide a draft BO/CO the week of October 29, 2018.

- November 8, 2018: The Service sent a draft BO/CO to the Forest Service.

- November 27, 2018: The Service received comments from the Forest Service on the draft BO/CO.

BIOLOGICAL AND CONFERENCE OPINION

DESCRIPTION OF THE PROPOSED ACTION

Your April 16, 2018, BA includes a complete description of the proposed action. This consultation addresses Forest Service's authorization for APS to conduct ongoing utility vegetation management, line maintenance, vehicle travel, and repair of access routes along utility corridors within and adjacent to permitted ROWs in Arizona National Forests (excluding the Coronado National Forest, which has no project components) in accordance with existing special use permits and line easements. The proposed action includes Forest Service's authorization for APS to use herbicides in addition to currently authorized manual and mechanical treatment of vegetation. Currently, APS manages vegetation within and adjacent to ROWs using only manual and mechanical methods.

Background

APS has numerous transmission, distribution, and communication lines that cross United States National Forest System (NFS) lands in Arizona. These utility lines lie within existing ROW corridors that the Forest Service authorizes under special use permits. As part of the special use permit conditions, the Forest Service authorizes APS to conduct maintenance-related activities within an established ROW. APS is permitted to work within and outside (for hazard tree removal) the established corridors (or ROW) to maintain their structures and manage vegetation. Failure to address vegetation clearance could result in wildfires, major power outages, and injury to life or property. Additionally, Federal regulations and utility standards require ROW maintenance by APS, including vegetation inspections and treatment to maintain lines in safe and reliable operating conditions (NERC Reliability Standard FAC-003-4). Utility maintenance

that occurs on private land or other non-Forest Service in-holdings is not part of the special use permit or part of this consultation because the Forest Service does not authorize these maintenance activities or have jurisdiction on non-Forest Service lands.

APS currently manages incompatible vegetation within their authorized ROWs on NFS lands in Arizona using a combination of mechanical and manual methods, as described in the proposed action below. These vegetation management (and line maintenance) activities were addressed in a 2008 programmatic consultation (USFWS 2008a) and subsequent re-initiation of consultation in 2013 (USFWS 2013a) and 2017 (USFWS 2018) that included multiple utility companies.

Historically, APS has not used herbicides for vegetation management within their ROWs on NFS lands in Arizona. However, APS has used herbicides as part of its vegetation management programs within ROWs on non-federal lands since the mid-1990s. APS is proposing to use selected, registered, and Forest Service-approved herbicides in addition to its currently authorized manual and mechanical treatment methods as part of an Integrated Vegetation Management Program for its ROWs.

The proposed action includes continued implementation of all currently authorized APS line maintenance activities (i.e., manual treatments of hazard vegetation and manual and mechanical routine vegetation maintenance, routine and hazard aerial and ground-based utility inspection patrols, maintenance of lines, hardware and structures, maintenance of access routes, and other associated actions). In addition, the proposed action includes the use of herbicides within APS' ROWs on NFS lands in Arizona. This consultation will cover these activities for a period of 20 years. This is a new consultation because unlike the original BO (USFWS 2008) and subsequent consultations, this project includes only APS corridors (no other utility companies are included), analyzes herbicide use for vegetation management, and addresses changes in the location and number of power lines.

This consultation does not cover new power line construction, extension of existing power lines into new ROWs, creation of new roads to access existing power lines, or re-building existing power lines outside of existing ROWs. This consultation also does not cover emergency power line repair and vegetation treatments (e.g. fire, major storms). Special use permits for individual lines may expire and renewed within the 20-year timeframe of this project. If the special use permit requires APS to operate or expand their action area beyond what we considered in this consultation, the Forest Service will review the proposed changes and re-initiate consultation with the Service, as appropriate.

Proposed Action

The proposed action of this consultation is Forest Service authorization for APS to conduct ongoing maintenance of power line infrastructure and management of vegetation, including herbicide applications, within existing APS power line ROWs on NFS lands in Arizona for a period of 20 years. APS has incorporated into the proposed actions standard operating procedures (SOPs) and conservation measures to avoid or minimize effects to covered species (see Conservation Measures section below). APS has organized the proposed actions into the following general categories: 1) vegetation inspections; 2) hazard vegetation; 3) routine vegetation maintenance; 4) defensible space around poles; 5) herbicide application; 6) vegetation

disposal; 7) maintenance of overhead and underground lines; 8) vehicle travel; and, 9) repair of access routes. The following is a general description of the proposed actions implemented by APS.

Vegetation Inspections – Aerial, LiDAR, and Ground
Aerial inspections are primarily used for transmission ROWs though some distribution ROWs are also inspected aerially. APS performs aerial inspections using a passenger helicopter. To approach the ROW, the helicopter flies 2,000 to 3,000 feet above the ground at about 115 to 160 miles per hour (mph). Once the helicopter reaches the power line, the pilot flies about 50 to 300 feet above ground level (AGL) at 50 to 95 mph above or adjacent to the power line. Flights occur anytime during the day between 6:00 a.m. and 5:00 p.m. from Monday to Friday. During inspection flights, the helicopter may hover or circle over areas to get a closer look at the trees and may even land occasionally to ground inspect a specific location. Landing the helicopter during vegetation inspections is rare. Crews note hazard vegetation found during aerial inspections and ground crews later inspect the areas (as described below in "ground inspections") to confirm whether the vegetation is truly a hazard. APS conducts flights at least once per year for the transmission lines, but flights may occur up to three times a year for various reasons, including planning work or audit purposes. The majority of the distribution lines are not inspected by air, except for lines with known problem areas, lines with remote and difficult to access areas, or because the line is adjacent to a transmission line that is inspected aerially. APS inspects a maximum of 20 distribution lines aerially in a given year.

APS contracts with outside vendors for gathering aerial photography and Light Detection and Ranging (LiDAR) data along the transmission power lines. LiDAR collects information regarding the vegetation clearances along and adjacent to the power line ROWs, power line structures and locations, creates line models of topography using elevation contours within the power line ROWs, identifies vegetation encroachments, and other deliverables as requested. The vendors compile the data for APS to analyze for planning, identifying, and prioritizing vegetation and line maintenance work.

APS LiDAR flights occur as needed on the transmission system. Flights could occur during any time of year, but ideally, APS schedules the flights for the late spring or early fall timeframe when there are leaves on the trees and no snow on the ground. Data could be captured using rotary aircraft or fixed wing aircraft. The aircraft flies between 300 and 1000 feet above the ground and directly over the power lines. The aircraft makes one pass on each transmission line. Where two or more power lines are parallel, the pilot flies each of the two lines with a single pass (two passes total). If APS uses rotary aircraft to collect data, it may require refueling away from an existing airport if the distance between airports is great enough. For fueling, the pilot will land the aircraft in a parking lot or other open, previously disturbed area and near a well-established road. A tanker truck drives in on a well-established road to meet the aircraft for refueling. This type of refueling is rare and APS will conduct this action in accordance with species-specific conservation measures.

APS conducts ground inspections to plan and audit routine vegetation maintenance or herbicide treatment projects. Crews conduct these ground inspections three months to a year prior to the scheduled work. The inspection may take from one week to a month depending on the

information required by the Forest Service, the length of the line, the width of the ROW, and the degree of difficulty for access. On transmission lines, hazard ground inspections typically occur as a follow up to verify hazards identified during an aerial hazard inspection. Crews typically conduct these types of inspections only on portions of line where aerial inspections identified hazards. On distribution lines, crews combine hazard inspections with the inspection for planning routine vegetation maintenance and herbicide work. Ground inspections may occur singly or in conjunction with each other, at any time of year, and generally occur during the day. One to three inspectors are involved in conducting ground inspections by driving a pickup truck, all-terrain vehicle (ATV; quad or 6-wheeler), or by walking. Cres access the power line ROW by vehicle using classified roads or Forest Service authorized roads and trails. Many of the ROWs have Forest Service-authorized roads and trails that weave in and out of the ROW. Crews often use these roads and trails to inspect the power line. Vehicles may also travel off-road within, but not outside of, the ROW corridor during ground inspections, though this would be infrequent and subject to terrain constraints.

Manual and Mechanical Vegetation Maintenance – Hazard and Routine
Manual and mechanical vegetation treatments selectively remove or prune incompatible vegetation under and around utility lines while retaining desirable vegetation. Manual and mechanical vegetation maintenance of ROWs consists of: 1) hazard vegetation maintenance, and 2) routine vegetation maintenance. Hazard vegetation is defined as a plant or portion thereof (e.g., limb) that could come into close proximity or contact with electrical lines, structures, or equipment and cause an electrical fault. APS considers vegetation hazardous if it exhibits a structural defect (defined in Appendix B of the BA) that increases the chances of it failing and contacting utility infrastructure. In addition, inspectors may consider healthy vegetation a hazard if it has encroached close enough to an electric utility line that it could result in an electrical fault. Hazard vegetation can occur within or outside of an ROW. Hazard vegetation may need to be removed immediately (i.e., "Imminent Hazard") or prior to regularly scheduled maintenance (i.e., "Off-Cycle Hazard"). APS may remove or prune hazard vegetation at any time of year.

Most vegetation management within ROWs on Forest Service-administered lands falls within the routine maintenance category. Routine vegetation maintenance is the process of identifying and removing or pruning vegetation within a ROW using manual and mechanical methods within a predetermined maintenance schedule. The schedule depends on the maintenance needs for each individual power line, determined by inspections, with the maintenance schedule ranging from one to 7 years. The goal of routine vegetation maintenance is to control vegetation that is incompatible with the utility infrastructure while maintaining compatible, desirable vegetation. Routine vegetation maintenance generally only involves maintaining regrowth of vegetation since the last cycle of work, although crews may treat some mature vegetation towards the edge of ROWs. Crews will conduct vegetation maintenance in accordance with all SOPs and conservation measures listed in Appendices E and F of the BA.

Manual treatment is the most common method of vegetation management used by APS on NFS lands in Arizona. Crews remove or prune trees and brush using chainsaws and hand tools (e.g., hand or pole saws). Crews typically cut or fell vegetation from the ground, although workers may climb trees, and prune or remove the tree by dropping it in pieces. Crews may also use

bucket trucks to access the upper portions of trees where access allows. Work crews typically consist of 2 to 5 individuals and are trained in utility line clearance tree work and safety procedures for working near energized power lines. Larger crews (e.g., 60 to 100 individuals) may work on larger projects. Except for emergency situations or species timing restrictions, crews operate during daylight hours at any time of year during favorable weather conditions.

Mechanical treatment of vegetation within ROWs involves the use of a cutting device mounted on a vehicle with rubber tires or tracks that cuts and masticates or pulverizes vegetation. The mechanical equipment generally operates at sound levels of 90 to 100 decibels (dBA). Mechanical treatments may occur at any time of year except during species timing restrictions or other limiting circumstances (e.g., weather). Other factors that influence the use of mechanical vegetation treatments include archaeological sites, sensitive plant and wildlife species, public use areas, target vegetation species and density, terrain, and access. One driver and one grounds person typically operate the equipment. The grounds person directs the mower and may operate a chainsaw to cut trees that the mower is unable to access. A manual crew may also precede or follow the mechanical equipment to clean up, scatter debris, and prune or remove trees that the mechanical equipment could not access. All vegetation the mower masticates will remain in the ROW and depth will not exceed four inches.

APS conducts vegetation maintenance around transmission towers and transmission and distribution poles, guy wires, and anchors during routine vegetation maintenance or as a separate cycle of vegetation maintenance. Typically, APS maintains a 40-foot radius from the pole or tower on 115, 230, 345, and 500-kilovolt (kV) lines, and a 10-foot radius for distribution and 69kV lines. Pole clearing only occurs within the permitted ROW on all towers and on poles where Defensible Space Around Poles treatments (DSAP; described below) are not implemented. Pole clearing is different from DSAP treatment in that it includes poles that do not hold equipment that may spark. The purpose of pole clearing is to: 1) provide a cleared area to minimize burning of structures during a fire under or near the power line; 2) maintain the integrity of the structures by preventing trees or vegetation from falling on guy wires or other equipment; and, 3) provide access for line maintenance vehicles or a helicopter. Crews remove shrubs and trees within the appropriate radius to reduce/clear fuels and allow space for vehicles to access the pole or tower. The extent of vegetation maintenance ranges from the complete removal of all woody vegetation in areas of high fire risk or high vegetation density, to only thinning out existing vegetation to the extent that only grasses, forbs, and small growing shrubs remain.

Defensible Space Treatment Around Poles

As part of its vegetation management program, APS has initiated a statewide utility pole-clearing program referred to as DSAP. The objective of this program is to remove contiguous fuels (grass to shrub, shrub to tree) and ladder fuels from around the poles to reduce the risk of fire ignition from spark-emitting electrical equipment, and to protect wooden utility poles during a fire. The treatment creates a “cylinder” of combustible-free space measuring 20 feet in diameter around the base of each pole that has spark-emitting electrical equipment (e.g., transformers, capacitor banks, switches). Crews remove vegetation around the pole and up to a distance of 10 feet as authorized under APSs existing vegetation maintenance programs. Crews move all combustible debris outside the 20-foot diameter area using leaf rakes, string trimmers, handsaws,

and herbicides. APS conducts pre-inspections of poles using trucks or ATVs and then submits selected treatment sites to the Forest Service for approval. APS currently schedules poles for treatment every three years.

Under the proposed action, crews apply cut-stump herbicide treatments following manual clearing. About 10% of applications may also include a soil or pre-emergent herbicide application to keep vegetation from growing inside the combustible-free space cylinder. In this instance, crews would apply herbicide directly to the soil using a hand-held sprayer within the 20-foot diameter area. APS uses herbicides specifically labeled for soil applications, including pre-emergent herbicides. Pre-emergent herbicides prevent the germination of seeds, extending control of vegetation. All treatments would remain within existing ROWs.

The poles of interest are generally located near residential areas, and only about 10% of APS distribution poles on NFS land house equipment with the potential to spark. Currently there are approximately 13,863 APS distribution poles on NFS land and APS estimates that 1,418 of those poles have equipment that could spark. Therefore, there are 10.2 acres that crews may use DSAP treatment on NFS lands in Arizona.

Vegetation Disposal
Once crews cut vegetation during hazard or routine maintenance, they use several disposal methods to disperse the wood and debris in a way that minimizes effects to plant and animal species while mitigating fire risk. The method of disposal for a particular power line or project is determined through coordination between the Forest Service and APS prior to vegetation maintenance work. During manual vegetation treatments, limbs and logs <9 inches in diameter at breast height (dbh) may be lopped and scattered or chipped. Logs >9 inches dbh remain where felled and cut in sections to lay flush with the ground. During mechanical treatments, the cutting implement masticates the vegetation into small chips, which crews then broadcast across the ROW. During tree removal, crews cut stumps within 12 inches of the ground or if possible cut them flush with the ground. Crews will ensure that all areas with the potential for flowing water (e.g., culverts, ditches, washes) are free of slash, logs, and other debris from vegetation removal operations.

Herbicides
Historically, APS has not used herbicides on NFS lands. The proposed action includes authorization for APS to use registered, Forest Service-approved herbicides within ROWs on NFS lands in Arizona as part of the APS Integrated Vegetation Management (IVM) program. APS would use herbicide treatments subsequent to the currently authorized manual and mechanical treatments (described above) to manage the regrowth of incompatible vegetation within ROWs and allow compatible early-successional plant communities to develop in their place. APS would continue to use non-herbicide treatment methods (i.e., manual and mechanical methods) in combination with herbicide treatments. However, these activities should eventually result in decreased frequency and intensity of manual, mechanical, and herbicide treatments over time.

The proposed action would allow APS to apply herbicides in targeted locations using handheld sprayers from tanks in backpacks or mounted on all-terrain vehicles (ATVs). Appendix E of the

BA includes design features to ensure human and environmental safety, as well as efficient and effective herbicide treatments associated with the proposed action. APS would access all ROWs using existing roads and routes. No aerial or broadcast application of herbicides would occur under the proposed action.

APS will use Forest Service-approved herbicide active ingredients within authorized ROWs, including treatment techniques proposed for each herbicide (Table 1). APS may use other active herbicide ingredients in the future, but only following Forest Service evaluation and approval. Crews will apply herbicides would be applied according to all Forest Service procedures and EPA-approved product label directions.

APS would comply with changes in label directions that may occur in the future, as well as with federal and state registration requirements. In the future, Forest Service approved herbicides the can be proposed for use within utility ROWs on NFS lands after appropriate analysis and approval, including additional consultation with the Service for treatments that may affect threatened or endangered species.

Crews would apply herbicides using Thinvert, a paraffinic (waxy) oil that is included on the Forest Service's List of Approved Herbicide Formulations and Adjuvants. Thinvert replaces water as the carrier for the herbicide and results in ultra-low-volume applications.

The herbicide formulation would vary, as determined by licensed applicators and by the species of vegetation to be controlled, but would follow label requirements. Depending on the herbicides included in the custom blend, the ratio of carrier to herbicide would be 90 to 94% carrier to six to 10% herbicide. A rate of 3 to 5 gallons of total mix per acre would result in application of approximately 24 to 39 ounces of active ingredient to one acre of vegetation. An acre of actual treatment could span several miles of an authorized ROW, depending on ROW width and vegetation density. Application rates would vary depending on the size of the treatment areas, but would not exceed those stated on manufacturers' labels.

APS would employ a closed chain-of-custody method for herbicide storage and mixing. All mixing would occur at an off-site blending facility and would use returnable or reusable product-dedicated storage containers. The herbicide mix would consist of a premixed "ready to use" formulation stored in a sealed container. No on-site mixing of herbicides would occur. Support vehicles would be available at intervals along the authorized ROW to transfer the herbicide mix from storage containers to application containers. Crews would use a closed leak-proof connection or valve to transfer the mix from the storage container to the application container. In situations where a "closed connection" is not available and the applicator must fill a container (typically a backpack) at the job site, the applicator will comply with the operational and spill contingency plan prepared during the pesticide use proposal (PUP) process. This would only occur in rare circumstances, as applicators typically fill containers prior to leaving for the site. A licensed applicator would supervise the application process, and APS will conduct monitoring to ensure crews follow proper application techniques, cleanup, personal protective equipment, and safety procedures. Crews will remove the herbicide-mix storage containers from the authorized ROW daily following the application process, and return storage containers to the supplier when empty.

The closed containers are product-dedicated and applicators can only refill them with the same custom-blended herbicide formulations that they originally contained. Each sealed container is labeled with an EPA product registration number and the concentration of ingredients, including active ingredients, diluting agents, and adjuvants. APS will track the movement of the herbicides and containers through the chain of custody by its unique identification number in the container's bar code. Where appropriate, APS will sign treated areas as listed on the herbicide product label and in accordance with Forest Service requirements. Any posting of treated areas would include a notice that crews are treating the area within the authorized ROW in accordance with manufacturers' guidelines, and resources for additional information.

Each time APS plans to use herbicide treatments within the ROW, they would submit a pesticide use permit (PUP, form FS 2100-2) to the Forest Supervisor of the National Forest where treatment is to take place. The Forest Service Invasive Species Program Lead for that particular forest would also receive the submitted PUP. The PUP would detail the location and herbicides proposed for use in the annual treatment plans and maintenance projects submitted to the Forest Service. Each PUP would include information on project specifications; herbicides proposed for use and the rate of application; surfactants; approximate dates of application; incompatible species targeted; key personnel responsibilities; appropriate site-specific buffers (as provided in biological conservation measures or herbicide manufacturers' labels); and procedures for communication, safety, spill response, and emergencies. The Forest Service would approve a PUP once it has been determined to be adequate; after which APS could then begin herbicide treatments within the specified ROW.

After completion of the manual and mechanical vegetation removal, APS could employ four different herbicide application methods: foliar, cut stump, basal, and pre-emergence. The first three methods are spot treatments that target specific vegetation. The last, pre-emergence, is where herbicide is applied directly to the soil to prevent germination and is limited to being used only where the DSAP exists. The BA includes images of each technique and associated equipment. All four techniques are spot treatments that target specific vegetation, rather than broadcast treatments applied throughout the entire authorized ROW. These techniques use backpack sprayers for areas only accessible by walking and tank sprayers mounted on ATVs for areas accessible by off-road motorized vehicles. Both the backpacks and the tank mounted ATVs would have handheld sprayers for accurate spot treatment. The proposed action does not include broadcast or aerial spraying.

The foliar application technique applies herbicide to the leaves of target vegetation and is most effective on smaller vegetation (e.g., 1 to 5 feet tall), but crews can apply it to vegetation up to 10 feet tall. Foliar applications are selective to the incompatible vegetation and crews would not apply it to an entire ROW unless incompatible vegetation is very dense throughout the ROW. Applicators typically use foliar herbicide applications over the course of two years. The first application would occur one to two years after manual or mechanical treatment, depending on the regrowth of incompatible vegetation. The second treatment would occur one to two years after the initial application. The frequency of herbicide treatments thereafter depends on the amount of incompatible vegetation regrowth. Routine herbicide treatments would occur cyclically every 8 years based on incompatible vegetation growth. Foliar application is the

preferred technique when treating most ROW vegetation and APS anticipates it will constitute 75 to 80% of all herbicide treatments.

APS would use the cut-stump application technique on woody species that normally re-sprout after cutting. Crews would apply herbicides to the exposed cambium (living inner bark) of the stump and on exposed roots. Herbicides are most successful when applicators use them immediately after they cut the tree trunk/bole (typically within 15 minutes). Crews would use the cut-stump technique for small-scale localized treatment of small groups of trees. APS anticipates this technique would constitute 15-20% herbicide applications. The frequency of this application technique would be consistent with manual and mechanical treatments.

Basal application treatments combine an herbicide with penetrant oil, and applicators put the mixture directly on the bark of a standing tree, encircling stems and root collars. The herbicide is most effective on trees with smooth bark, when the lower 12 to 18 inches of the trunk is treated. The oil penetrates the bark, carrying the herbicide into the plant. Applicators can conduct basal herbicide applications at any time of the year, but the treatments are most effective during the growing season. This technique can be highly effective on trees that are less than six inches in diameter. APS anticipates that crews will rarely use basal applications and that this technique will constitute less than 5% of all herbicide treatments.

APS would use pre-emergence herbicide applications only within the prescribed DSAP. Crews would use a soil or pre-emergent herbicide to keep vegetation from growing around poles housing electrical equipment in about 10% of the DSAP. Within the 10-foot radius of these poles, applicators would apply herbicide directly to the soil using a hand-held sprayer. Applicators would use herbicides specifically labeled for soil applications to prevent the germination of seeds, extending the length of vegetation control achieved through manual clearing methods. Crews generally apply pre-emergent herbicides when there is predictable rainfall within 30 to 60 days of application, in order to minimize the potential for photo-degradation of the herbicide before it has had a chance of moving into the germination zone of the soil. Crews would not apply pre-emergent herbicides to sandy soils because the herbicide would likely flush down past the germination zone in the soil before it has a chance to be effective. APS would not use pre-emergent herbicides in riparian areas or areas where ground water level is high because the high-water table could pull the herbicide past the germination zone before it has a chance to be effective. In addition, crews would not apply pre-emergent herbicides on steep slopes where there is a chance that the soil and herbicide could erode downhill. APS and the Forest Service would review the use of pre-emergent herbicides during the PUP process and they would develop site-specific conditions to determine the appropriate use of pre-emergent herbicides. Appendix E of the BA contains design features associated with pre-emergence herbicide applications.

New or improved herbicide products could become available during implementation of the proposed action. If new or improved products become available, APS could use the new herbicide product without further NEPA and ESA analysis. This would be the case only if the new or improved product fits within the same effects-analysis disclosure as herbicides and/or active ingredients proposed for use in the BA. The Forest Service and APS would complete an analysis of the new herbicide's effects and determine whether to use the new product.

Transmission and Distribution Line Inspections – Overhead and Ground
APS conducts annual aerial inspections of transmission lines, but does not generally conduct aerial inspections of distribution lines. During the inspections, a helicopter flies along the power line at 35 to 70 mph at or just above the height of the structures at about 50 to 150 feet AGL, except where terrain or trees are such that a higher elevation is required. The helicopter may hover or circle over the lines to get a closer look and may land near a potential problem site. Crews record any problems identified during the flight and schedule treatments, subject to seasonal timing restrictions identified in the conservation measures.

APS conducts ground inspections of all distribution lines annually. These inspections include a detailed survey of all lines, structures, hardware, and associated equipment. Typically, one or two inspectors driving a pickup truck or snow cat, or walking, visit the problem areas to document future repair work. Crews conduct the inspections using a line truck 90% of the time, an ATV 5% of the time, and walking 5% of the time. The inspector may examine the structure foundation conditions and access issues, and sometimes conducts minor repairs during the inspection (such as tightening hardware or replacing insulators). The inspector categorizes the identified issues as hazardous or non-hazardous. In addition, APS conducts a routine climbing inspection on all transmission lines, poles, or towers, and equipment and hardware every 10 years for wood structures and every seven years for steel structures to identify and fix equipment problems simultaneously along the lines. Climbing inspections can occur year-round. The 69, 115, and 230kV power lines typically use wood poles, but may sometimes have steel structures. The 345 and 500kV lines use steel support structures.

APS conducts wood pole inspections on a routine basis using a certified contractor to conduct the inspections. Crews inspect each APS transmission line every 10 years, so they visit about 10% of the 40,000-transmission wood poles each year. For distribution lines, contractors inspect about 10% of the 300,000 distribution poles across the state every 10 years. Approximately 7.5% of APS distribution lines occur on NFS lands, so crews only inspect a small percentage of distribution feeders on NFS land each year. Crews could conduct these inspections year-round. APS also conducts additional hazard inspections on transmission and distribution lines as the need arises.

Repair and Replacement Work
The life span for many components of the power line equipment ranges from 30 to 60 years. However, equipment may need repair or replacement at any time and the frequency of work is difficult to predict. Work on overhead lines may include maintenance on conductors, poles or towers, cross-arms, insulators, guy-wires, and all other supporting equipment and hardware. Repairs may include replacing flashed or broken insulators, tightening loose hardware, replacing missing hardware, repairing damaged conductors, replacing or repairing broken or lose ground wire connections, replacing cut/stolen ground wires, repairing twisted or damaged hardware, removing foreign objects, and repairing structure foundation conditions. Work on steel constructed transmission lines is similar to work on wood constructed transmission and distribution lines, except pole and cross-arm replacement does not occur. Small-scale repairs include repairing and replacing insulators and other small hardware and require only a bucket truck and a lineman to climb the pole to perform the work. Small-scale repairs occur more

frequently than large-scale repairs, which may include pole and/or cross-arm replacement and repair or replacement of damaged conductor and ground wires.

For wood pole replacement, crews place about 75% of poles in the ground and backfill with existing dirt and tamp the dirt down. Conversely, for 25% of the poles there is a shortage of dirt available for backfill, so an expanding foam is used. When crews replace wood poles are, they do not dig up and remove the previous pole, but dig a new hole for the replacement pole. They then cut the old wood pole down, at or near ground level. For steel structures, the legs sit within cement footers. APS may also conduct erosion control work around transmission structures if erosion has occurred around the footers or poles. If crews need to conduct erosion control around footers or poles, they typically us a bulldozer or backhoe to fix the eroded area. If a bulldozer or backhoe cannot access the area, then crews will do the work by hand. Erosion control is an infrequent action (less than one occurrence per year).

Underground Line Maintenance
APS has a total of 174 miles of underground distribution line on NFS lands in Arizona, totaling 408 acres. Line maintenance activities on underground lines include routine inspections, and repairs and replacement of switching cabinets, transformers, and underground cable. The switching cabinets and transformers are above ground structures. APS inspects the switching cabinets every four years at any time of year. Typically, APS does repair and replacement work on the underground cable on a reactionary basis. The first 10 years of the cable's life generally remain problem free. After this, the cable may fail and require repairs every five years. After the cable fails repeatedly, APS may replace the entire cable. This generally occurs after 30 years.

Repair of cable involves trenching around the cable to splice a section or replace the entire cable and repairing or replacing hardware for switching cabinets and transformers. Repairing underground cable involves bringing in a backhoe or other digger device to dig four feet into the ground. For simple splicing repairs, crews dig a hole about eight feet long, four feet wide, and four feet deep. If they need to replace a cable needs, then the digger device digs a trench four feet wide and four feet deep along the length of the cable or section of cable in order to pull out the existing cable and replace it with the new cable. As stated above, the lifespan of underground cable is about 30 years, but APS replaces or repairs cables as needed. All vehicle travel to underground cable work occurs on existing access routes and within the permitted ROW for the cable.

Vehicle Travel
Vehicle travel for vegetation management and line maintenance occurs on roads or motorized trails that approach and/or follow along or within the ROW. Vehicles also travel off-road within the power line ROWs as authorized as part of operations and maintenance. Specific access routes are coordinated with each National Forest prior to work through operation plans and corridor management plans. Truck travel is limited to Forest Service classified roads and roads authorized for use by the special use permit for the ROW or by the appropriate National Forest. Truck travel also occurs off-road within the power line ROW. ATV use is limited to either classified roads or motorized trails, roads and trails authorized for use by the special use permit for the ROW, or by the appropriate National Forest. ATV travel also occurs off-road within the

power line ROW as authorized as part of operations and maintenance. Vehicles do not typically travel off-road outside of the ROW.

Repair of Access Routes
In most cases, the power lines in the action area have roads that approach and/or follow along or within the ROW. Utility vehicles may travel on or off-road within the utility ROW, but do not typically travel off-road outside of the ROW. In some instances, to provide safe and reasonable access to the ROW corridor, the utilities must repair or conduct minor road maintenance. Repair activities may include removing or repairing traffic control structures, grading, removing displaced objects (e.g., rocks, fallen trees), and pruning. Equipment used to repair or provide reasonable route access may include hand tools, backhoes, graders, and small dozers.
All activities are coordinated with the appropriate Forest Service District. The frequency of these activities is rare, therefore extremely infrequent within sensitive species habitats.

Conservation Measures

The implementation of specific conservation measures provided below varies among components of the proposed action and species. Conservation measures for additional species are included in Appendices A and B of this document. Appendices E and F in the BA provide additional details regarding the proposed project's design features and conservation measures.

General Riparian Area Conservation Measures

1. Implement the following buffers for riparian, wetlands, and other aquatic habitats when applying herbicides:
    a. Herbicides rated as class 0 require no buffer. Herbicides that meet this criterion include aminocyclopyrachlor, aminopyralid, glyphosate (aquatic formulation), imazapic, and imazapyr (aquatic and nonaquatic formulations).
    b. Herbicides rated as class 1 require a buffer of 30 feet from of a waterbody or wetland. Herbicides that meet this criterion include chlorsulfuron, clopyralid, fluroxypyr (acid formulation), glyphosate (non-aquatic formulation), isoxaben, metsulfuron methyl, picloram, sulfometuron methyl, tebuthiuron, and triclopyr (amine salt formulation).
    c. Herbicides rated as class 2 require a buffer of 50 feet from a waterbody or wetland and a buffer of 10 feet from riparian vegetation, if present. Herbicides that meet this criterion include 2,4-D (aquatic and non-aquatic amine salt formulations), dicamba, and triclopyr (ester formulation).
    d. Herbicides rated as class 3 require a buffer of 100 feet from the edge of a waterbody or wetland and a buffer of 20 feet from riparian vegetation, if present. Herbicides that meet this criterion include 2,4-D aquatic and non-aquatic ester formulations.
    e. For pool habitats, do not apply herbicides within 30 feet of pools when there is no surface flow of water in and out of pool.

Southwestern Willow Flycatcher

1. Implement Riparian Area Conservation Measures and Design Features found in Appendices E and F of the BA within occupied and suitable southwestern willow flycatcher habitat.

2. Do not drive ATVs within 50 meters (164 feet) of southwestern willow flycatcher habitat (riparian vegetation) during the nesting season (May 1 to August 31) except on existing roads that are open to the public.

3. Avoid herbicide application during the nesting season from May 1 to August 31 whenever possible. If herbicide application is necessary during the nesting season, ensure that crews use the least number of trips in and out, and that workers walk only in the ROW and open areas and not in dense thickets of vegetation where suitable nesting habitat may occur.

4. Avoid non-hazardous groundwork disturbance in the floodplain containing occupied breeding habitat or suitable breeding habitat if occupancy is unknown between May 1 and August 31.

5. For LiDAR flights do not land for refueling or stage the helicopter within 0.25 mile of southwestern willow flycatcher occupied habitat during the breeding season.

Western Yellow-billed Cuckoo

1. Implement Riparian Area Conservation Measures and Design Features found in Appendices E and F of the BA within occupied and suitable yellow-billed cuckoo habitat.

2. Do not drive ATVs within 50 meters (164 feet) of yellow-billed cuckoo suitable breeding habitat during the breeding season from May 1 to September 30 except on existing roads that are open to the public.

3. Avoid herbicide application during critical times of the nesting season from May 1 to September 30 whenever possible. If herbicide application is necessary during the nesting season, ensure that crews use the least number of trips in and out, and that workers walk only in the ROW and open areas and not in dense thickets of vegetation.

4. For non-hazardous groundwork, avoid groundwork disturbance in the floodplain containing occupied breeding habitat between May 1 and September 30.

5. For LiDAR flights, APS would not land the helicopter for refueling within 0.25 mile of yellow-billed cuckoo occupied habitat during the breeding season.

Mexican Spotted Owl

1. Use only Class 0 or Class 1 herbicides within the Predatory Avian toxicity group (see Appendix G of the BA) within Mexican spotted owl PACs and recovery habitat. This includes all proposed herbicides with the exception of dicamba.

2. Do not apply herbicides rated as Class 2 or Class 3 within 300 feet of the outside perimeter of a PAC and/or within Mexican spotted owl recovery habitat. Dicamba is the only proposed herbicide that falls under this category.

3. When driving ATVs through a Mexican spotted owl PAC during the breeding season (March 1 to August 31), ATVs must remain on existing roads that are open to the public.

4. Do not apply herbicides during the Mexican spotted owl-breeding season (March 1 to August 31) in the 14 Mexican spotted owl PACs with overhead power lines (Table 11). For remaining PACs, crews may apply herbicides of Class 0 or 1 within the Predatory Avian toxicity group within during the breeding season using backpack sprayer or other hand-operated equipment only after review and approval by the Forest Service and Service. We will consider this treatment only in ROWs that occur at or near the edge of the PAC and do not intersect the PAC.

5. For routine vegetation maintenance and non-hazard line maintenance, avoid groundwork (use of equipment) within PACs between March 1 and August 31.

6. For routine vegetation maintenance and non-hazard line maintenance, avoid use of loud machinery within 0.25 mile of PACs between March 1 and August 31, with the goal of limiting noise levels at PAC boundary to less than 69 dBA.

7. When disposing of vegetation (routine or hazard treatments) within a Mexican spotted owl PAC, coordinate disposal methods with the District and, if appropriate/feasible, leave large logs (>12 inches dbh) whole rather than cutting into smaller sections.

8. When working in PACs during the owl-breeding season, APS will consolidate hazard line maintenance and/or vegetation hazard treatments into the least number of days and number of trips. This will minimize the duration and frequency of disturbance to breeding Mexican spotted owl.

9. When feasible, schedule hazard line maintenance and vegetation treatments after breeding season (i.e., defer activity to later date when the hazard is a low priority or not an imminent threat to safe operation of lines and structures).

10. For APS LiDAR flights do not land the helicopter for refueling within 0.25 mile of a Mexican spotted owl PAC during the breeding season.

Narrow-headed and Northern Mexican Gartersnakes
Since the submittal of the final BA, the Forest Service, APS, and the Service collaboratively revised the following conservation measures from what appeared in the final BA. Therefore, the

conservation measures listed below supersede those included in the final BA.

1. For vegetation management activities, implement all relevant project design features found in Appendix E of the BA.

2. For all maintenance activities that will occur within gartersnake habitat, APS will provide crews with training material on identifying gartersnakes, what to do if a worker observes a gartersnake in the project area, and on following the conservation measures in order to reduce effects to individuals and habitat. The Service will develop training materials with APS and the Forest Service, which could include field guide materials, natural history literature, photographs, maps, comparison to other common snakes, contact lists, and instructions for collecting photo-documentation.

3. For all maintenance activities within gartersnake habitat, crews will only drive on designated open roads and will not drive over-land. Within upland gartersnake habitat, crews will avoid driving over-land unless it is necessary for safe maintenance of utility infrastructure. When driving within gartersnake habitat, drive at a speed slow enough to allow a driver to see and avoid a surface-active snake.

4. For all maintenance activities, crews will coordinate the timing of activities in order to consolidate work into the least number of days and least number of trips in and out of gartersnake habitat. This measure will minimize the duration and frequency of disturbance to gartersnakes.

5. For all maintenance activities, crews shall not touch or handle snakes of any species.

6. For routine vegetation maintenance work, do not use mechanical mowers within gartersnake habitat.

7. For herbicide applications, implement the Riparian Area, Wetland, and Other Aquatic Habitat Conservation Measures found in Appendix F of the BA in all riparian areas, wetlands, and aquatic habitats within the action area of the project. Appendix G of the BA includes a list of herbicides and toxicity ratings for reptiles. In addition, implement the following buffers for gartersnake proposed critical habitat and other known occupied habitat not proposed or designated as critical habitat outside of riparian, wetland, and aquatic habitat buffers:

    a. Herbicides rated as class 0 in the reptile toxicity group require no buffer and crews may be apply them within gartersnake proposed critical habitat and occupied habitat outside of the riparian, wetland, and aquatic habitat buffers. Herbicides that meet this criterion include aminocyclopyrachlor, aminopyralid, 2, 4-D (aquatic and nonaquatic ester formulations), fluroxypyr, glyphosate (aquatic formulation), imazapic, imazapyr (aquatic and nonaquatic formulations), picloram, sulfometuron methyl, tebuthiuron, and triclopyr (ester formulation).
    b. Do not apply herbicides rated as class 1 in the reptile toxicity group within 30 feet of gartersnake proposed critical habitat and occupied habitat. Herbicides that meet this criterion include: chlorsulfuron, clopyralid, 2,4-D (aquatic and

nonaquatic amine salt formulations, glyphosate (non-aquatic formulation), isoxaben, metsulfuron methyl, and triclopyr (amine salt formulation).

c. Do not apply herbicides rated as class 2 in the reptile toxicity group within 50 feet of gartersnake proposed critical habitat and occupied habitat. Herbicides that meet this criterion include dicamba.

d. Do not apply herbicides rated as class 3 in the reptile toxicity group within 100 feet of gartersnake proposed critical habitat and occupied habitat. There are currently no herbicides proposed that meet this criteria.

8. When conducting maintenance activities within gartersnake habitat, avoid filling in or crushing burrows and crevices at the base of trees or between large rocks and boulders; and, avoid moving large rocks, boulders and logs unless necessary for safe maintenance of utility infrastructure. The crew may require a biological monitor if the work involves ground disturbance or movement of rocks and logs (see number 9 below).

9. For significant ground disturbing work in gartersnake habitat, a biological monitor must be present during the activity to look for gartersnakes. The Service, in coordination with the Forest Service and APS, will develop the specific biological monitoring protocol.

    a. A biological monitor will be needed while digging or filling the trench or hole, as well as for regular inspections of any hole or trench in order to ensure entrapment of any gartersnakes does not occur and to avoid injuring a gartersnake during digging or burying a snake while back-filling.

    b. APS will coordinate with the Service and the Forest Service if there is uncertainty as to whether a work event needs a biological monitor.

    c. If there is a gartersnake detection, APS must report the detection to the Service within 72 hours. If the crew or the biological monitor detects a gartersnake, work may continue with implementation of the conservation measures.

10. For work that does not require a biological monitor (see number 9), report any observations of narrow-headed gartersnakes or northern Mexican gartersnakes on or near the worksite to APS, Service, and Forest Service designated representatives within approximately one week of the observation. Include photos with the reports whenever possible (see items a-d below for photo guidelines). The crew training will define whom to report the information. The report should include at least the location (i.e., pole number or GPS coordinate), date, time, photo, and any observational information. If the crew observes a gartersnake, work may continue with implementation of the conservation measures above. APS and contractors should apply the following guidelines regarding the type of camera to be used and how to take a useful photo:

    a. A camera must be available for crews when working in gartersnake habitat. The camera must be present on-site during work and located in an accessible location (e.g., in the truck if truck is located adjacent to work, in a bag or backpack that is brought to the work site, or in a pocket).

b. Not every crewmember is required to have a camera on site, but one camera must be available at the site when working in gartersnake habitat.
c. The camera should meet or exceed these specifications: 20 or more megapixels and at least 20 times optical zoom.

d. When photographing the snake, do not chase or disturb it. If possible, zoom in on the head and neck region and take a photo that is focused and not blurry. This is critical for correctly identifying the individual to species.

11. After a gartersnake has been detected and reported in accordance with numbers 9 and 10 above, the Service, Forest Service, and APS will review all relevant information and evaluate whether further discussion and protective action is necessary to address gartersnake conservation.

Action Area

The action area is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR § 402.02). In delineating the action area, we evaluated the farthest-reaching physical, chemical, and biotic effects of the action on the environment.

The project area for this BO includes those areas where the Forest Service authorizes a special use permit for APS to operate and maintain vegetation and power line infrastructure. The project area includes all APS power lines, both overhead and underground, on the Apache-Sitgreaves, Coconino, Kaibab, Prescott, and Tonto National Forest lands in Arizona. The project area consists of 1,781.9 miles of overhead and underground power line and 17,241.97 acres of overhead and underground power line ROWs on NFS lands in Arizona (Figures 1-6). APS calculated acreages using the widest possible ROW width that they may treat under the proposed vegetation management action. They calculated the ROW width by compiling existing permitted ROW widths for each line voltage and using the maximum width for that voltage in the calculations (Table 2). Please refer to the BA for comprehensive data on power line miles and ROW acres within the project area by voltage and National Forest.

STATUS OF THE SPECIES AND CRITICAL HABITAT

The information in this section summarizes the range-wide status of each species that we considered in this BO. Further information on the status of these species can be found in the administrative record for this project, documents on our web page (Arizona Ecological Services Office Documents by Species), and in other references cited in each summary below.

Southwestern Willow Flycatcher

Description
The southwestern willow flycatcher is a small grayish-green passerine bird (Family Tyrannidae) measuring approximately 5.75 inches. The bird's song is a sneezy "fitz-bew" or a "fit-a-bew," and the call is a repeated "whit." It is one of four currently recognized willow flycatcher

subspecies (Phillips 1948, Unitt 1987, Browning 1993). The flycatcher 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 (CA), AZ, New Mexico (NM), western Texas (TX), southwestern Colorado (CO), southern Utah (UT), extreme southern Nevada (NV), and extreme northwestern Mexico (Sonora and Baja) (Unitt 1987).

Listing and critical habitat

The Service listed the southwestern willow flycatcher as endangered, without critical habitat on February 27, 1995 (USFWS 1995). We later designated critical habitat on July 22, 1997 (USFWS 1997a). On August 20, 1997, the Service published a correction notice in the Federal Register to clarify the lateral extent of the designation (USFWS 1997b).

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

On October 19, 2005, the Service re-designated critical habitat for the southwestern willow flycatcher (USFWS 2005). The final designation included 737 river miles across southern CA, AZ, NM, southern NV, and southern UT. The lateral extent of critical habitat includes areas within the 100-year floodplain.

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

On January 3, 2013, the Service completed its flycatcher critical habitat revision by designating approximately 1,227 stream miles as critical habitat. We designated these areas as stream segments, with the lateral extent including the riparian areas and streams that occur within the 100-year floodplain or flood-prone areas encompassing a total area of approximately 208,973 acres.

The Southwestern Regional Director signed and released the final recovery plan for the southwestern willow flycatcher in March 2003 (USFWS 2002). The Recovery Plan describes the reasons for endangerment, status of the flycatcher, identifies important recovery actions, includes detailed issue papers on management issues, and provides recovery goals. Recovery is based on numerical and habitat related goals for each Management Unit, and the establishment of long-term conservation plans (USFWS 2002).

The five-year review for the flycatcher was completed in August 2014 and in December 2017 (along with a 12-month finding on a petition to delist the flycatcher) by the Arizona Ecological

Services Field Office and is posted on the Field Office's web site (Arizona Ecological Services Field Office website).

Reasons for endangerment
Biologist attribute the decline of the flycatcher to the loss, modification, and fragmentation of riparian breeding habitat, along with a host of other factors including loss of wintering habitat and brood parasitism by the brown-headed cowbird (Sogge *et al.* 1997, McCarthey *et al.* 1998). A variety of factors cause habitat loss and degradation, including urban, recreational, and agricultural development, water diversion and groundwater pumping, channelization, dams, and excessive livestock grazing. Fire is an increasing threat to willow flycatcher habitat (Paxton *et al.* 1996), especially in monotypic saltcedar vegetation (DeLoach 1991) and where water diversions and/or groundwater pumping desiccates riparian vegetation (Sogge *et al.* 1997). Willow flycatcher nests can be parasitized by brown-headed cowbirds (*Molothrus ater*), which lay their eggs in the host's nest. The presence of livestock and range improvements, such as waters and corrals; agriculture; urban areas; golf courses; bird feeders; and trash areas enhance feeding sites for cowbirds. When these feeding areas are in close proximity to flycatcher breeding habitat, especially coupled with habitat fragmentation, cowbird parasitism of flycatcher nests may increase (Tibbitts *et al.* 1994).

Habitat
The southwestern willow flycatcher breeds in dense riparian habitats from sea level in California to approximately 8,500 feet in AZ and southwestern CO. 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's willow (*Salix geyeriana*), coyote willow (*Salix exigua*), Goodding's willow (*Salix gooddingii*), boxelder (*Acer negundo*), saltcedar (*Tamarix* spp.), 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, research describes four basic habitat types for the southwestern willow flycatcher: monotypic willow, monotypic exotic, native broadleaf dominated, and mixed native/exotic (Sogge *et al.* 1997).

The flycatcher's habitat is dynamic and can change rapidly: nesting habitat can grow out of suitability; saltcedar habitat can develop from seeds to suitability in about four to five years; heavy runoff can remove/reduce habitat suitability in a day; or river channels, floodplain width, location, and vegetation density may change over time. The flycatcher's use of habitat in different successional stages may also be dynamic. For example, over-mature or young habitat not suitable for nest placement can be occupied and used for foraging and shelter by migrating, breeding, dispersing, or non-territorial 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 its breeding range in AZ, southern NV and UT, and western NM. In 2001 in AZ, 323 of the 404 (80%) 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 (USFWS 2002), prey populations (Durst 2004) and physiological conditions (Owen and Sogge 2002) of flycatchers breeding in native and exotic vegetation has revealed no difference (Sogge *et al.* 2005).

The introduced tamarisk leaf beetle was first detected defoliating tamarisk within the range of the southwestern willow flycatcher in 2008 along the Virgin River in St. George, Utah. Initially, people thought that this insect would not 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, surveyors found the beetle in southern NV/UT and northern AZ/NM within the flycatchers breeding range. Surveyors also detected the beetle along the Colorado River below Hoover Dam in 2012. In 2017, surveys located the beetle farther into central AZ, with detections in western AZ along the Bill Williams, Santa Maria, and Big Sandy River, and in Maricopa County along the Hassayampa River. In NM, the beetle has traveled south along the Rio Grande from Colorado and north from releases in TX. By 2016, surveys found the beetle throughout the length of the Rio Grande in NM, in particular at the densest population of breeding flycatchers at Elephant Butte Reservoir. Because tamarisk is a component of about 50% of all known flycatcher territories (Durst 2017), continued spread of the beetle has the potential to alter significantly the distribution, abundance, and quality of flycatcher nesting habitat and negatively affect breeding attempts.

Range-wide distribution and abundance

Based on the latest population estimates available, there are 308 known southwestern willow flycatcher breeding sites in California, Nevada, Arizona, Utah, New Mexico, and Colorado (all sites from 1993 to 2012 where a territorial flycatcher has been detected) holding an estimated 1,629 territories (Durst 2017). It is difficult to arrive at a grand total of flycatcher territories since surveyors do not visit all sites are annually. Numbers have increased since the Service listed the bird and some habitat remains un-surveyed; however, after nearly two decades of intense surveys, the existing numbers are not too far past the upper end of Unitt's (1987) estimate of 500-1000 pairs. About 50% of the 1,629 estimated territories throughout the subspecies range are located at four general locations (Cliff/Gila Valley – New Mexico, Roosevelt Lake - Arizona, San Pedro River/Gila River confluence – Arizona, and Middle Rio Grande, New Mexico).

Arizona distribution and abundance

While numbers have significantly increased in Arizona (145 to 679 territories from 1996 to 2012) (English *et al.* 2006, Durst 2017), overall distribution of flycatchers throughout the state has not changed much. Currently, we think population stability in Arizona is largely dependent on the presence of three population centers - Roosevelt Lake, San Pedro/Gila River confluence, upper Gila River. Therefore, the result of catastrophic events or losses of significant populations, in size or location, could greatly change the status and survival of the species.

Conversely, expansion into new habitats or discovery of other populations would improve the known stability and status of the flycatcher.

Critical habitat
The Service based the primary constituent elements (PCEs) of designated critical habitat on riparian plant species, structure and quality of habitat and insects for prey.

1. PCE 1— *Riparian vegetation.* Riparian habitat along a dynamic river or lakeside, in a natural or manmade successional environment (for nesting, foraging, migration, dispersal, and shelter) that is comprised of trees and shrubs that can include Goodding's willow, coyote willow, Geyer's willow, arroyo willow (*Salix lasiolepsis*), red willow (*S. laevigata*), yewleaf willow (*S. taxifolia*), Pacific willow (*S. lucida*), boxelder, saltcedar, Russian olive, buttonbush, cottonwood, stinging nettle, white alder, velvet ash (*Fraxinus velutina*), poison hemlock (*Conium maculatum*), blackberry, seep willow (*Baccharis salicifolia*), oak (*Quercus* spp.), rose (*Rosa* spp.), sycamore (*Platanus* spp.), false indigo (*Baptisia* spp.), western poison-ivy (*Toxicodendron rydbergii*), grape (*Vitis* spp.), Virginia creeper (*Parthenocissus quinquefolia*), Siberian elm (*Ulmus pumila*), and walnut (*Juglans* spp.) and some combination of:
    (a) Dense riparian vegetation with thickets of trees and shrubs that can range in height from about two to 30 m (about 6 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% to 100%) 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 ha (0.25 ac) or as large as 70 ha (175 ac).

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

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

Past Consultations
Since listing in 1995, at least 240 Federal agency actions have undergone (or are currently under) formal section 7 consultation throughout the flycatcher's range. This list of consultations is included in the administrative record for this consultation. Since the Service finalized flycatcher critical habitat in 2005, we have completed at least 33 BOs in Arizona (within and outside designated critical habitat). While we issued many BOs for the previous critical habitat designation, the stream reaches and constituent elements have changed.

Development, urbanization, grazing, recreation, native and non-native habitat removal, dam operations, river crossings, ground and surface water extraction, and other activities continue to affect negatively the distribution and extent of all stages of flycatcher habitat throughout its range. We did not anticipate introduced tamarisk-eating leaf beetles 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, surveys detected beetles defoliating habitat within the range of flycatcher habitat in southern Nevada, and along the Colorado River in the Grand Canyon and near Shiprock, Arizona. As of 2017, leaf beetles had spread to the only known breeding sites along the lower Colorado River in Arizona, along the Hassayampa River in Maricopa County, and at the largest flycatcher breeding population range-wide along the Middle Rio Grande at Elephant Butte, New Mexico. 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. Tribes have established a variety of Management Plans in California, Arizona, and New Mexico to guide conservation of the flycatchers. Additionally, during the development of the critical habitat rule, landowners developed management plans for some private lands along the Owens River in California and Gila River in New Mexico. These conservation actions are just a portion of those that managers have established across the subspecies' range.

Western Yellow-billed Cuckoo

Description
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, are boldly patterned tail feathers with black and white below. They are medium-sized birds about 12 inches in length, and about 2 ounces in weight. Males and females differ slightly; the males have a slightly smaller body size, smaller bill, and the white portions of the tail tend to form distinct oval spots. In females the white spots are less distinct and tend to be connected (Hughes 1999).

Morphologically, the yellow-billed cuckoos throughout the western continental United States and Mexico are generally larger, with significantly longer wings, longer tails, and longer and

deeper bills (Franzreb and Laymon 1993). Birds with these characteristics occupy the Western Distinct Population Segment (DPS) and we refer to them as the "western yellow-billed cuckoo." The Service listed only the Western DPS as a threatened species (USFWS 2014a). 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).

Listing and Proposed Critical Habitat
We listed the yellow-billed cuckoo as a threatened species under the ESA on October 3, 2014 (79 FR 59992). The Service proposed critical habitat for the yellow-billed cuckoo on August 15, 2014 (79 FR 48548; USFWS 2014b). Proposed critical habitat encompasses 546,335 acres across the western United States.

Additional details on the status of this species and proposed critical habitat are found in our final rule to list the species as threatened (79 FR 59992) and our proposed rule to designate critical habitat (79 FR 48548). We incorporate the discussions of the status of this species from these documents herein by reference.

We list the proposed PCEs of yellow-billed cuckoo critical habitat below:

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.
2. Adequate prey base. Presence of prey base consisting of large insect fauna and frogs for adults and young in breeding areas during the nesting season and in post-breeding dispersal areas.
3. Dynamic riverine processes, hydrologically altered systems that provide suitable habitat, or Madrean evergreen woodland in southeastern AZ. 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.

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 [AOU] 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 (AOU 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 (USFWS 2014a, 2014b). The largest remaining breeding areas are in southern and central California, Arizona, along the Rio Grande in New Mexico, and in northwestern Mexico (USFWS 2014b).

In Arizona, the species was a common resident in the (chiefly lower) Sonoran zones of southern, central, and western Arizona (Phillips *et al*. 1964). The yellow-billed cuckoo now nests primarily in the central and southern parts of the state.

Habitat
Western populations of yellow-billed cuckoos are most commonly found in dense riparian woodlands, consisting primarily of Fremont cottonwood (*Populus fremontii*), willow, and mesquite (*Prosopis* spp.), along riparian corridors in otherwise arid areas (Laymon and Halterman 1989, Hughes 1999). Occupied riparian habitat in Arizona may also contain boxelder, Arizona alder (*Alnus oblongifolia*), Arizona walnut (*Juglans major*), Arizona sycamore (*Platanus wrightii*), oak, netleaf hackberry (*Celtis reticulata*), velvet ash, Mexican elderberry (*Sambuccus mexicanus*), saltcedar (also called salt cedar), acacia (*Acacia* spp.), and seep willow (Corman and Magill 2000, Corman and Wise-Gervais 2005). Tamarisk may be a component of breeding habitat, but there is usually a native riparian tree component within the occupied habitat (Gaines and Laymon 1984, Johnson *et al*. 2008, McNeil *et al*. 2013, Carstensen *et al*. 2015). Although surveyors most commonly find cuckoos in gallery riparian forest, in Arizona, they may also use narrow bands of riparian woodland (AGFD 2015, Cornell Lab of Ornithology 2015). Adjacent habitat on terraces or in the upland (such as mesquite) can enhance the value of these narrow bands of riparian woodland.

In most of its range, western yellow-billed cuckoos primarily breed 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 feet). However, in the Southwest, cuckoos can also breed in higher gradient drainages, and narrower and drier reaches of riparian habitat. Western yellow-billed cuckoos in Arizona will also use areas of mesquite and oak woodlands some distance from riparian gallery forests, including in the mountains of southeastern Arizona. Recent surveys found yellow-billed cuckoos with some regularity in these non-traditional habitats (Corman and Magill 2000; WestLand Resources, Inc. 2013a, 2013b, 2015a, 2015b; MacFarland and Horst 2015, 2017; Tucson Audubon 2015). Throughout the western yellow-billed cuckoo range, a large majority of nests are placed in willow trees, but cottonwood, mesquite, walnut, box elder, sycamore, hackberry, oak, alder, soapberry (*Sapindus saponaria*), acacia, and tamarisk are also used (Laymon 1980, Hughes 1999, Corman and Magill 2000, Corman and Wise-Gervais 2005, Holmes *et al*. 2008, Tucson Audubon 2015).

Habitat for the western yellow-billed cuckoo in much of its range 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 riparian habitat can occur in different types of regulated and unregulated flows depending on the interaction of the water and the physical characteristics of the landscape (Poff *et al*. 1997; USFWS 2002). Hydrologic conditions at western yellow-billed cuckoo breeding sites can vary widely between years and during low rainfall years, water or saturated soil may not be present. Cuckoos may move from one area to another within and between years in response to hydrological conditions. They may also 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).

At the landscape level, the available information suggests the western yellow-billed cuckoo requires large tracts of willow-cottonwood, mesquite forest, or Madrean evergreen woodland for their nesting habitat. Habitat can be relatively dense, contiguous stands, irregularly shaped mosaics of dense vegetation with open areas, or narrow and linear. Individual home ranges during the breeding season average over 40 hectares, and home ranges up to 202 hectares 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 may be a mix of shrubs, ground cover, and scattered trees (Sechrist *et al*. 2009, Carstensen *et al*. 2015). In Arizona, adjacent habitat is usually more arid than occupied nesting habitat; if the habitat produces large insects, cuckoos use these adjacent habitats for foraging. Habitat types include Sonoran desertscrub, Mojave desertscrub, Chihuahuan desertscrub, chaparral, semi desert grassland, plains grassland, and Great Basin grasslands (Brown and Lowe 1982, Brown 1994, Brown *et al*. 2007).

Large expanses of gallery riparian woodland (hydro-riparian) habitat supports greater densities of cuckoos than less dense reaches of scattered riparian trees (cottonwood, willow, walnut, ash, mesquite) or xero-riparian woodlands of mesquite, oak, acacia, hackberry, desert willow, and juniper. However, these less dense reaches of scattered riparian trees and xero-riparian woodlands are also important to yellow-billed cuckoos as nesting substrate, foraging habitat, and as a buffer between more hydric sites and the adjacent, xeric uplands, which decreases the edge/interior ratio of a given hydro-riparian patch.

Yellow-billed cuckoos appear to use a wide variety of habitat during migration, but we do not know much about their migration habitat needs. We have detections of migrating yellow-billed cuckoos in coastal scrub, second-growth forests and woodlands, hedgerows, forest edges, and in smaller riparian patches than those used for breeding.

Presence in Arizona

In a survey in 1999 that covered 265 mi (426 km) of river and creek bottoms (a subset of statewide cuckoo habitat), 172 yellow-billed cuckoo pairs and 81 single birds were located in Arizona (Corman and Magill 2000). Surveyors located twelve drainages in Arizona with greater than 10 yellow-billed cuckoo detections. The drainages are the 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. Surveys have found smaller populations at the Roosevelt Lake complex, Upper Tonto Creek, Pinto Creek, and Sycamore Creek in Pajarito Mountains, Oak Creek, Lower Cienega Creek, Babocomari River, Pinal Creek, Bonita Creek, San Bernardino National Wildlife Refuge, Hooker Hot Springs, Big Sandy River, and many smaller drainages. Surveys have located cuckoos during the breeding season in several drainages in the Catalina Mountains, Rincon Mountains, Santa Rita Mountains, Patagonia Mountains, Canelo Hills, Huachuca Mountains, and Pajarito/Atascosa Mountains (Cornell Lab of Ornithology 2015, MacFarland and Horst 2015, 2017). There are still many drainages throughout Arizona without surveys; therefore, we will likely discover additional yellow-billed cuckoo locations. In addition to gallery riparian forest

and mesquite woodlands, yellow-billed cuckoos are also using more xeroriparian drainages in the foothills and mountains of southeastern Arizona. This kind of habitat is more typical of habitat where surveys find cuckoos in Sonora, Mexico.

Threats

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, USFWS 2014a, 2014b). Several interrelated factors are responsible for cuckoo habitat loss and degradation. These factors include the alteration of flows in rivers and streams, mining, encroachment into suitable habitat from agricultural and other development activities on breeding and wintering grounds, stream channelization and stabilization, diversion of surface and ground water for agricultural and municipal purposes, livestock grazing, wildfire, establishment of non-native vegetation, drought, and prey scarcity due to pesticides (Ehrlich *et al*. 1992, USFWS 2014b). Pesticide use is widespread in agricultural areas in the western yellow-billed cuckoo breeding range in the United States and northern Mexico. Yellow-billed cuckoos are exposed to pesticides on their wintering grounds, as evidenced by DDT found in their eggs and eggshell thinning in the United States (Grocki and Johnston 1974, Laymon and Halterman 1987, Hughes 1999, Cantu-Soto *et al*. 2011). Because much of the species' habitat is in proximity to agriculture, the potential exists for direct and indirect effects to a large portion of the species in these areas through altered physiological functioning, prey availability, and, therefore, reproductive success, which ultimately results in lower population abundance and curtailment of the occupied range (Laymon 1980, Laymon 1998, Hughes 1999, Colyer 2001, Mineau and Whiteside 2013, Hopwood *et al*. 2013, Mineau and Palmer 2013, USFWS 2014b).

The ongoing threats, including small isolated populations, cause the remaining populations to be increasingly susceptible to further declines and local extirpations through increased predation rates, barriers to dispersal by juvenile and adult yellow-billed cuckoos, chance weather events, fluctuating availability of prey populations, collisions with tall vertical structures during migration, defoliation of tamarisk by the introduced tamarisk leaf beetle (*Diorhabda* spp.), increased fire risk, and climate change events (Thompson 1961, McGill 1975, Wilcove *et al*. 1986). The warmer temperatures already occurring in the southwestern United States may alter the plant species composition of riparian forests over time. An altered climate may also disrupt and change food availability for the western yellow-billed cuckoo if the timing of peak insect emergence changes in relation to when the cuckoos arrive on their breeding grounds to feed on this critical food source.

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 threats 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.

Mexican Spotted Owl

Description
The Mexican spotted owl is a medium-sized owl with large dark eyes and no ear tufts. The plumage is brown with numerous white spots and posterior underparts have short, horizontal bars or spots. Tails of Mexican spotted owls are brown with thin white bands. Young owls less than five months old have a downy appearance. Length is about 0.4 m (17 in) and the typical wingspan is approximately 1.0 m (3.3 ft). Females are larger than males.

Listing and Critical Habitat
In 1993, the Service listed the Mexican spotted owl (hereafter, referred to as Mexican spotted owl, spotted owl, and owl) as threatened under the Act. The Service appointed the Mexican spotted owl Recovery Team in 1993 (USFWS 1993), which produced the Recovery Plan for the Mexican spotted owl in 1995 (USFWS 1995). The Service released the final Mexican spotted owl Recovery Plan, First Revision (Recovery Plan) in December 2012 (USFWS 2012a). The Service designated critical habitat for the spotted owl in 2004 on approximately 8.6 million acres (3.5 million hectares) of Federal lands in Arizona, Colorado, New Mexico, and Utah (USFWS 2004).

A detailed account of the taxonomy, biology, and reproductive characteristics of the Mexican spotted owl is found in the Final Rule listing the owl as a threatened species (USFWS 1993), the original Recovery Plan (USFWS 1995), and in the revised Recovery Plan (USFWS 2012a). We include the information provided in those documents herein by reference.

Within the designated boundaries, critical habitat includes only those areas defined as protected habitats and restricted (now called "recovery") habitats (unoccupied owl foraging, dispersal, and future nest/roost habitat) as defined in the Recovery Plan (USFWS 1995, 2012a). Since owl habitat can include both canyon and forested areas, the Service identified PCEs for both areas. The PCEs identified for the owl within mixed-conifer, pine-oak, and riparian forest types that provide for one or more of the owl's habitat needs for nesting, roosting, foraging, and dispersing are:

1. A range of tree species, including mixed conifer, pine-oak, and riparian forest types, composed of different tree sizes reflecting different ages of trees, 30 to 45%t of which are large trees with dbh (4.5 ft above ground) of 12 inches or more;
2. A shade canopy created by the tree branches covering 40% or more of the ground;
3. Large, dead trees (snags) with a dbh of at least 12 inches.
4. High volumes of fallen trees and other woody debris;
5. A wide range of tree and plant species, including hardwoods; and,
6. Adequate levels of residual plant cover to maintain fruits and seeds, and allow plant regeneration.

The PCEs listed above usually are present with increasing forest age, but their occurrence may vary by location, past forest management practices or natural disturbance events, forest-type productivity, and plant succession. Younger forested stands may contain these PCEs, especially when the stands contain remnant large trees or patches of large trees. Certain forest management

practices may also enhance tree growth and mature stand characteristics where management allows for older, larger trees to persist.

Steep-walled rocky canyonlands occur typically within the Colorado Plateau Ecological Management Unit (EMU), but also occur in other EMUs. Owls use canyon habitat for nesting, roosting, and foraging, and includes landscapes dominated by vertical-walled rocky cliffs within complex watersheds, including many tributary side canyons. These areas typically include parallel-walled canyons up to 1.2 miles (2 kilometers) in width (from rim to rim), with canyon reaches often 1.2 miles (2 kilometers) or greater, and with cool north-facing aspects. The PCEs related to canyon habitat include one or more of the following:

1. Presence of water (often providing cooler and often higher humidity than the surrounding areas);
2. Clumps or stringers of mixed-conifer, pine-oak, piñon-juniper, and/or riparian vegetation;
3. Canyon walls containing crevices, ledges, or caves; and,
4. High percent of ground litter and woody debris.

Distribution and Habitat

The spotted owl occurs in forested mountains and canyonlands throughout the southwestern United States and Mexico (Gutiérrez *et al*. 1995). It ranges from Utah, Colorado, Arizona, New Mexico, and the western portions of Texas south into several States of Mexico. Although the owl's entire range covers a broad area of the southwestern United States and Mexico, it does not occur uniformly throughout its range. Instead, the Mexican spotted owl occurs in disjunct localities that correspond to isolated forested mountain systems, canyons, and in some cases steep, rocky canyon lands. Known owl locations indicate that the species has an affinity for older, uneven-aged forest, and inhabits a physically diverse landscape in the southwestern United States and Mexico.

In addition to this natural variability in habitat influencing owl distribution, human activities also vary across the owl's range. The combination of natural habitat variability, human influences on owls, international boundaries, and logistics of implementation of the Recovery Plan necessitates subdivision of the owl's range into smaller management areas. The 1995 Recovery Plan subdivided the owl's range into 11 "Recovery Units" (RUs): six in the United States and five in Mexico. In the revision of the Recovery Plan, we renamed RUs as EMUs to be in accord with current Service guidelines. We divided the Mexican spotted owl's range within the United States into five EMUs: Colorado Plateau (CP), Southern Rocky Mountains (SRM), Upper Gila Mountains (UGM), Basin and Range-West (BRW), and Basin and Range-East (BRE). Within Mexico, the Revised Recovery Plan delineated five EMUs: Sierra Madre Occidental Norte, Sierra Madre Occidental Sur, Sierra Madre Oriental Norte, Sierra Madre Oriental Sur, and Eje Neovolcanico.

Mexican spotted owl surveys since the 1995 Recovery Plan have increased our knowledge of owl distribution, but not necessarily of owl abundance. Population estimates, based upon owl surveys, recorded 758 owl sites from 1990 to 1993, and 1,222 owl sites from 1990 to 2004 in the United States. The Recovery Plan (USFWS 2012a) lists 1,324 known owl sites in the United States. An owl site is an area used by a single or a pair of owls for nesting, roosting, or foraging.

The increase in the number of known owl sites is mainly a product of managers completing new owl surveys within previously unsurveyed areas. For example, several National Parks within southern Utah, Grand Canyon National Park in Arizona, Guadalupe National Park in West Texas, Guadalupe Mountains in southeastern New Mexico and West Texas, Dinosaur National Monument in Colorado, Cibola National Forest in New Mexico, and the Gila NF in New Mexico. Thus, we cannot infer an increase in abundance in the species range-wide from these data (USFWS 2012a). However, we do assume that an increase in the number of areas we consider occupied is a positive indicator regarding owl abundance.

We are currently working with the Southwestern Region of the Forest Service to conduct a pilot study for the population monitoring recommended in the Revised Recovery Plan (USFWS 2012a). The effort to conduct this work occurred during the 2014 breeding season and has continued into the 2015 breeding season, but only on NFS lands. The Recovery Team, Forest Service, and the Rocky Mountain Bird Observatory (RMBO, contractor) are continuing to collect data and develop a strategy for incorporating additional lands (e.g., National Park Service, Bureau of Land Management, Department of Defense) into the monitoring. Currently, based on the work conducted by the Forest Service and RMBO, we have a process for conducting range-wide population monitoring, but we need to develop the potential strategy for collecting range-wide habitat monitoring data.

Threats

The Service cited two primary reasons for the original listing of the Mexican spotted owl in 1993: (1) the historical alteration of its habitat as the result of timber-management practices; and, (2) the threat of these practices continuing. We also cited the danger of stand-replacing fire as a looming threat at that time. Since publication of the original Recovery Plan (USFWS 1995), we have acquired new information on the biology, threats, and habitat needs of the Mexican spotted owl. Threats to its population in the United States (but likely not in Mexico) have transitioned from commercial-based timber harvest to the risk of stand-replacing wildland fire (USFWS 2012a). Recent forest management has moved away from a commodity focus and now emphasizes sustainable ecological function and a return toward pre-settlement fire regimes, both of which have potential to benefit the spotted owl. However, as stated in the revised Recovery Plan (USFWS 2012a), there is much uncertainty regarding thinning and burning treatment effects and the risks to owl habitat with or without forest treatment as well. Therefore, efforts to reduce fire risk should evaluate the effects of treatments on owls and retention of or movement towards desired conditions.

Southwestern forests have experienced larger and more severe wildland fires from 1995 to the present, than prior to 1995. Climate variability combined with unhealthy forest conditions may also synergistically result in increased negative effects to habitat from fire. The intensification of natural drought cycles and the ensuing stress placed upon overstocked forested habitats could result in even larger and more severe fires in owl habitat. Several fatality factors have been identified as particularly detrimental to the Mexican spotted owl, including predation, starvation, accidents, disease, and parasites.

Historical and current anthropogenic uses of Mexican spotted owl habitat include both domestic and wild ungulate grazing, recreation, fuels reduction treatments, resource extraction (e.g.,

timber, oil, gas), and development. These activities have the potential to reduce the quality of owl nesting, roosting, and foraging habitat, and may cause disturbance during the breeding season. Livestock and wild ungulate grazing is prevalent throughout the range of the owl and can have a negative effect on the availability of grass cover for prey species. Recreation effects are increasing throughout the Southwest, especially in meadow and riparian areas. There is anecdotal information and research that indicates that owls in heavily used recreation areas are much more erratic in their movement patterns and behavior. Fuels reduction treatments, though critical to reducing the risk of severe wildland fire, can have short-term adverse effects to owls through habitat modification and disturbance. As the human population grows in the southwestern United States, small communities within and adjacent to wildlands are being developed. This trend may have detrimental effects to spotted owls by further fragmenting habitat and increasing disturbance during the breeding season.

Several fatality factors have been identified as particularly detrimental to the Mexican spotted owl, including predation, starvation, accidents, disease, and parasites. For example, West Nile Virus also has the potential to affect the Mexican spotted owl negatively. Researcher have documented the virus in Arizona, New Mexico, and Colorado, and preliminary information suggests that owls may be highly vulnerable to this disease (Courtney *et al*. 2004). Unfortunately, due to the secretive nature of spotted owls and the lack of intensive monitoring of banded birds, we will most likely not know when owls contract the disease or the extent of its effect to the owl range-wide.

Currently, high-severity, stand-replacing fires are influencing ponderosa pine and mixed conifer forest types in Arizona and New Mexico. Uncharacteristic wildland fire is probably the greatest threat to the Mexican spotted owl within the action area. Landscape level, high severity wildland fires, such as the Rodeo-Chediski Fire (2002), the Wallow Fire (2011), and the Whitewater-Baldy Complex (2012) have resulted in the loss of tens of thousands of acres of occupied and potential nest/roost habitat across significant portions of the Mexican spotted owl's range. Although owls will forage in severely burned areas, habitat is often lacking for nesting and roosting in these areas, particularly when high severity fire affects large patches of habitat (Jones *et al*. 2016). Fuels reduction treatments, though critical to reducing the risk of severe wildland fire, can have short-term adverse effects to owls through habitat modification and disturbance. As the human population grows in the southwestern United States, small communities within and adjacent to wildlands are being developed. This trend may have detrimental effects to spotted owls by further fragmenting habitat and increasing disturbance during the breeding season.

Finally, global climate variability may also be a threat to the owl. Changing climate conditions may interact with fire, management actions, and other factors discussed above, to increase effects to owl habitat. Studies have shown that since 1950, the snowmelt season in some watersheds of the western U.S. has advanced by about 10 days (Dettinger and Cayan 1995, Dettinger and Diaz 2000, Stewart *et al*. 2004). Researchers think that such changes in the timing and amount of snowmelt are signals of climate-related change in high elevations (Smith et al. 2000, Reiners *et al*. 2003). The effect of climate change is the intensification of natural drought cycles and the ensuing stress placed upon high-elevation montane habitats (Cook *et al*. 2004, Breshears *et al*. 2005, Mueller *et al.* 2005, IPCC 2007). The increased stress put on these habitats is likely to

result in long-term changes to vegetation, and to invertebrate and vertebrate populations within coniferous forests and canyon habitats that affect ecosystem function and processes.

Overall, the status of the owl and its designated critical habitat has not changed significantly range-wide in the United States (which includes Utah, Colorado, Arizona, New Mexico, and extreme southwestern Texas). We base this statement upon the information we have, since issuance of the 2012 Land Resource Management Plan BOs for the National Forests in the Southwestern Region of the Forest Service (USFWS 2012b). What we mean by this is that the distribution of owls continues to cover the same area, and critical habitat is continuing to provide for the life history needs of the Mexican spotted owl throughout all of the EMUs located in the U.S. We do not have detailed information regarding the status of the Mexican spotted owl in Mexico, so we cannot make inferences regarding its overall status.

However, this is not to say that significant changes have not occurred within the owl's U.S. range. Wildland fire has resulted in the greatest loss of PACs and critical habitat relative to other actions (e.g., such as forest management, livestock grazing, recreation, etc.) throughout the U.S. range of the Mexican spotted owl. These wildland fire effects have mainly affected Mexican spotted owls within the UGM EMU (e.g., Slide and Schultz Fires on the Coconino National Forest, Rodeo-Chediski and Wallow Fires on the Apache-Sitgreaves National Forests and Whitewater-Baldy Complex on the Gila National Forest) and BRW EMU (e.g., Horseshoe 2 Fire on the Coronado National Forest). However, fire has affected owls in other EMUs as well (SRM EMU, the Santa Fe National Forest by the Las Conchas Fire, CP EMU by the Warm Fire). We do not know the extent of the effects of these wildland fires on actual owl numbers.

Narrow-headed Gartersnake

Description
The narrow-headed gartersnake is a small to medium-sized gartersnake with a maximum total length of 44 inches (Painter and Hibbitts 1996). Its eyes are set high on its unusually elongated head that narrows to the snout; and it lacks striping on the dorsum (top) and sides, which distinguish its appearance from other co-occurring gartersnake species (Rosen and Schwalbe 1988). Degenhardt *et al*. (1996), Rossman *et al*. (1996), and Ernst and Ernst (2003) further describe the species.

Listing and Proposed Critical Habitat
The narrow-headed gartersnake was designated a threatened species on July 8, 2014 (USFWS 2014c). The Service proposed critical habitat on July 10, 2013, and the rule has not been finalized (USFWS 2013c). Please refer to these documents for more in-depth information on the ecology and threats to the species and critical habitat, including references. We are incorporating the final and proposed rules herein by reference.

Proposed critical habitat for narrow-headed gartersnake occurs in six units in Arizona and New Mexico (USFWS 2013c). The Service considers all proposed critical habitat units occupied. Proposed critical habitat units occur in Greenlee, Graham, Apache, Yavapai, Navajo, Gila, and Coconino Counties in Arizona, as well as in Grant, Hidalgo, Sierra, and Catron Counties in New

Mexico. Within these areas, the proposed PCEs of the physical or biological features essential to the conservation of the narrow-headed gartersnake consist of the following four components:

- PCE 1: Stream habitat, which includes:
    a. Perennial or spatially intermittent streams with sand, cobble, and boulder substrate and low or moderate amounts of fine sediment and substrate embeddedness, and that possess appropriate amounts of pool, riffle, and run habitat to sustain native fish populations;
    b. 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;
    c. Shoreline habitat with adequate organic and inorganic structural complexity (e.g., boulders, cobble bars, vegetation, and organic debris such as downed trees or logs, debris jams), with appropriate amounts of shrub-and sapling-sized plants to allow for thermoregulation, gestation, shelter, protection from predators, and foraging opportunities; and
    d. Aquatic habitat with no pollutants or, if pollutants are present, levels that do not affect survival of any age class of the narrow-headed gartersnake or the maintenance of prey populations.

- PCE 2: Adequate terrestrial space (600 ft. 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;

- PCE 3: A prey base consisting of viable populations of native fish species or soft-rayed non-native fish species; and

- PCE 4: An absence of non-native fish species of the families Centrarchidae and Ictaluridae, bullfrogs (*Lithobates catesbeianus*), and/or crayfish (e.g., *Orconectes virilis*, *Procambarus clarki*), or occurrence of these non-native species at low enough levels such that recruitment of narrow-headed gartersnakes and maintenance of viable native fish or soft-rayed non-native fish populations (prey) is still occurring.

Critical habitat does not include manmade structures (such as buildings, aqueducts, runways, roads, and other paved areas) and the land on which they are located existing within the legal boundaries on the effective date of this rule.

Distribution
The narrow-headed gartersnake historically ranged across the Mogollon Rim and along its associated perennial and intermittent drainages from central and eastern Arizona, southeast to southwestern New Mexico (Rosen and Schwalbe 1988; Rossman *et al*. 1996; Holycross *et al*. 2006a, b).

Population densities have noticeably declined at many sites, as compared to previous survey efforts (Holycross *et al*. 2006a, b; office files). Surveyors detected narrow-headed gartersnakes in only five of 16 historical localities in Arizona and New Mexico surveyed by Holycross *et al*.

(2006a, b) in 2004 and 2005. Existing sampling data indicate that perhaps only three populations of narrow-headed gartersnakes are relatively dense where this species remains somewhat reliably detected: 1) Tularosa River (NM), 2) Middle Fork Gila River (NM), and 3) Oak Creek-West Fork Oak Creek. Many known narrow-headed populations may now exist at low densities that are vulnerable to extirpation (Table 3).

Life History and Habitat
The narrow-headed gartersnake is widely considered one of the more aquatic of the gartersnakes (Drummond and Garcia 1983; Rossman *et al*. 1996), typically active between March and November (Nowak 2006). This species is strongly associated with clear, rocky streams (Rosen and Schwalbe 1988, Rossman *et al.* 1996), but has been observed using lake shoreline habitat in New Mexico (Rossman *et al*. 1996). Narrow-headed gartersnakes specialize on fish as their primary prey item (Rosen and Schwalbe 1988, Nowak 2006). Narrow-headed gartersnakes have a lower preferred temperature for activity as compared to other species of gartersnakes (Fleharty 1967).

Threats
The occurrence of harmful non-native species, such as the crayfish (*Orconectes virilis, Procambarus clarki*), numerous species of non-native fish, and to a lesser extent, bullfrogs (*Lithobates catesbeianus*), have contributed to range-wide declines in the narrow-headed gartersnake, and continues to be the most significant threat to this species (USFWS 2014c). Additional significant threats to narrow-headed gartersnake populations include dewatering of streams, alteration of stream flows, as well as catastrophic wildfires and associated habitat effects (e.g., siltation) (USFWS 2014c).

Northern Mexican Gartersnake

Description
The northern Mexican gartersnake, which reaches up to 44 inches total length, 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 because of its similarity of appearance to other native gartersnake species.

Listing and Proposed Critical Habitat
The northern Mexican gartersnake was designated a threatened species on July 8, 2014 (USFWS 2014c, 79 FR 38678). Please refer to this rule for more in-depth information on the ecology and threats to the species, including references. Critical habitat was proposed on July 10, 2013 (USFWS 2013c, 78 FR 41500), and has not yet been designated. Please refer to these documents for more in-depth information on the ecology and threats to the species and critical habitat, including references. We are incorporating the final and proposed rules herein by reference

Proposed northern Mexican gartersnake critical habitat occurs in 14 sub-basin and national wildlife refuge units in Arizona and New Mexico, totaling 421,423 acres (USFWS 2013c). In Arizona, proposed critical habitat is located in portions of the Verde, Agua Fria, Bill Williams, Upper Salt, San Pedro, Babocomari, Upper Santa Cruz and Upper Gila rivers; Tonto and

Cienega Creeks; Redrock Canyon; and Buenos Aires and San Bernardino National Wildlife Refuges. In New Mexico, proposed critical habitat is located in portions of Mule Creek and the Upper Gila River.

The primary constituent elements of the physical and biological features essential to northern Mexican gartersnake conservation are:

- PCE 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.

- PCE 2: Adequate terrestrial space (600 feet 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 (extended inactivity).

- PCE 3: A prey base consisting of viable populations of native amphibian and native fish species.

- PCE 4: An absence of non-native fish species of the families Centrarchidae and Ictaluridae, bullfrogs, and/or crayfish (*O. virilis, P. clarki*, etc.), or occurrence of these non-native species at low enough levels such that recruitment of northern Mexican gartersnakes and maintenance of viable native fish or soft-rayed, non-native fish populations (prey) is still occurring.

Distribution

The northern Mexican gartersnake historically occurred in every Arizona county and nearly every subbasin, from perennial or intermittent creeks, streams, and rivers as well as lentic wetlands such as cienegas, ponds, or stock tanks (Rosen and Schwalbe 1988, Rosen *et al.* 2001; Holycross *et al.* 2006a and b, Cotton *et al.* 2013). In New Mexico, the gartersnake had a limited distribution that consisted of scattered locations throughout the Upper Gila River watershed in Grant and western Hidalgo Counties (Price 1980, Fitzgerald 1986, Degenhardt *et al.* 1996, Holycross *et al.* 2006a, b). Within Mexico, northern Mexican gartersnakes historically occurred

within the Sierra Madre Occidental and the Mexican Plateau, comprising approximately 85% of the total range-wide distribution of the subspecies (Rossman *et al.* 1996).

Known viable and reliably detected northern Mexican gartersnake populations in the United States include: 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 middle/upper Verde River. In New Mexico and elsewhere in Arizona, the northern Mexican gartersnake may occur in extremely low population densities within its historical distribution; limited survey effort is inconclusive to determine extirpation of this highly secretive species. We do not have good information regarding the status of the northern Mexican gartersnake on tribal lands, such as the White Mountain or San Carlos Apache Tribes. We know less 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.

Sampling data indicate that only four populations of northern Mexican gartersnakes in the United States are relatively dense and where the species remains somewhat reliably detected. These populations are: 1) upper Santa Cruz River in the San Rafael Valley, 2) lower Tonto Creek, 3) Verde Valley, and 4) the Aquatic Research and Conservation Center (formally known as the Page Springs and Bubbling Ponds State Fish Hatcheries) adjacent to Oak Creek (Table 4).

Areas with protected backwaters, braided side channels and beaver ponds, isolated pools near the river mainstem, and edges of dense emergent vegetation that offer cover and foraging opportunities are important for acquisition of prey that includes native fish and amphibians.

Life History and Habitat

The northern Mexican gartersnake is an active predator and believed to depend upon a native prey base (Rosen and Schwalbe 1988). Northern Mexican gartersnakes forage along vegetated stream banks, and search for prey in water and on land using different strategies (Alfaro 2002). Its diet primarily consists of amphibians and fishes, such as adult and larval (tadpoles) native leopard frogs, as well as juvenile and adult native fish (Rosen and Schwalbe 1988). In situations where native prey species are rare or absent, this snake's diet may include non-native species, including larval and juvenile bullfrogs, western mosquitofish (Holycross *et al.* 2006 a, b; Emmons and Nowak 2013), or other non-native fishes. In places where the prey base consists of harmful non-native species, northern Mexican gartersnake recruitment may be affected.

Throughout its range-wide distribution, the northern Mexican gartersnake occurs at elevations from 130 to 8,497 feet (Rossman et al. 1996). Within Arizona and New Mexico, records generally come from elevations ranging from 130 to 6,200 ft. Drummond and Marcías-García (1983) consider this gartersnake a "terrestrial-aquatic generalist." Surveys often locate the northern Mexican gartersnake in riparian habitat, but it has also been found hiding under cover in grassland habitat up to a mile away from any surface water (Cogan 2015). The subspecies has historically been associated with three general habitat types: 1) source-area wetlands (e.g. Cienegas or stock tanks); 2) large-river riparian woodlands and forests; and 3) streamside gallery forests (Hendrickson and Minckley 1984, Rosen and Schwalbe 1988).

Threats
Harmful non-native species are a significant concern in almost every northern Mexican gartersnake locality in the United States and the most significant reason for their decline. Non-native species can contribute to starvation of gartersnake populations through competitive mechanisms, and may reduce or eliminate recruitment of young gartersnakes through predation. Other threats include dewatering or alteration of rivers and streams from dams, diversions, flood-control projects, and groundwater pumping that change flow regimes, reduce or eliminate habitat, and favor harmful non-native species; and effects from climate change and drought (USFWS 2014c, 79 FR 38678).

ENVIRONMENTAL BASELINE

The environmental baseline includes past and present effects of all Federal, State, or private actions in the action area, the anticipated effects of all proposed Federal actions in the action area that have undergone formal or early section 7 consultation, and the effect of State and private actions that 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 is defined as all areas to be affected directly or indirectly by the federal action and not merely the immediate area involved in the action (50 CFR § 402.02). In delineating the action area, we evaluated the farthest-reaching physical, chemical, and biotic effects of the action on the environment.

The action area is larger than the footprint of the project area and represents all areas affected directly or indirectly by the proposed actions. Effects from the proposed actions that extend beyond the project area footprint may also extend to adjacent or nearby non-Federal lands and are included as part of the action area.

The action area includes all APS power lines, both overhead and underground, on the Apache-Sitgreaves, Coconino, Kaibab, Prescott, and Tonto National Forest lands in Arizona. It includes the permitted ROW as specified in the Forest Service authorizations where vegetation management treatments will occur and herbicides may be applied.

The extent of the action area boundary includes all APS power line, vegetation management, and maintenance activities that occur within authorized ROWs on the Apache-Sitgreaves, Coconino, Kaibab, Prescott, and Tonto NFS lands in Arizona. It also includes hazard tree removal outside of these authorized ROWs, access routes on NFS lands, access routes on non-Federal land used to access the utility lines on NFS lands for these authorized activities, and airspace used to access and assess utility lines throughout the forests listed above (Figures 1-6).

In order to access ROW corridors to conduct power line and vegetation management on NFS lands, APS may travel over non-Forest Service land. We consider vehicle travel across non-Federal lands that are used solely to access NFS lands where the utility line maintenance

activities will occur part of the action area because the travel is essential to the Forest Service-authorized activity and therefore an interrelated effect of the action.

Since 2008, APS has consistently maintained the power line ROWs to desired conditions using manual and mechanical methods. As a result, much of the vegetation within the 1,781.9 miles of ROWs included in the proposed action was previously treated manually or mechanically to protect the various power lines and poles across NFS lands. As a result, the vegetation within these habitats is already in a modified state in comparison to the surrounding areas. However, in some stretches only a portion of the acreage within power line ROWs need vegetation management. Power lines may span across canyons, areas of slope, drainages, and washes at such a height that vegetation management or other maintenance activities are not necessary. Formal consultation with the Service has previously been completed on vegetation and power line maintenance of these ROWs in 2008 (UWFWS 2008a), with subsequent re-initiation of consultation in 2013 (USFWS 2013a) and 2017 (USFWS 2018). This consultation is the first to address the use of herbicides in helping control vegetation growth.

The proposed action occurs within a broad variety of habitats ranging from high volcanic mountains in northern Arizona to desert grasslands and shrub lands in central Arizona (Table 5). Land features include alpine peaks, mesas, steep canyons, rolling grasslands, and desert valleys. A few large rivers flow through the project area, including the Salt River and the Verde River. Elevations range from a low of 3,960 feet on the Tonto National Forest to a high of 10,000 feet on the Coconino National Forest.

Status of the species and critical habitat within the action area

Southwestern willow flycatcher in the action area
Southwestern willow flycatcher habitat occurs at six APS power lines across Forest Service-administered lands (Coconino, Prescott, and Tonto National Forests) in the action area (Table 6). The power line ROWs within the action area cross the Salt River, Tonto Creek, and the Verde River. The power lines within flycatcher suitable habitat cover a total distance of 3.07 miles and 12.85 acres of power line ROWs.

While southwestern willow flycatchers are known to nest along the Salt River, Tonto Creek, and Verde River, these six locations are not known to have nesting birds at the specific locations because of the historical removal of riparian vegetation. We know migratory flycatchers occur on the Salt River, Tonto Creek, and Verde River and we expect them to occur briefly within these ROWs.

Southwestern willow flycatcher critical habitat in the action area
All six APS power lines (at 20 crossings) mentioned above are located within southwestern willow flycatcher designated critical habitat (Table 6). The power lines within flycatcher critical habitat cover a total distance of 3.07 miles and 12.85 acres of power line ROWs. Within the 500-3 and NW-2 power line ROWs (5.97 acres), maintenance activities beside inspections are not anticipated because the lines are high above vegetation and there are no towers or poles within southwestern willow flycatcher habitat. For each of the other locations where power lines cross designated critical habitat for southwestern willow flycatchers (6.88 acres), APS presently

maintains vegetation within the ROWs to conditions that minimize the potential for interference with power lines.

The physical and biological features of critical habitat are associated with streams, water, and vegetation such as water, river flow, depth to groundwater, soils, and growth of vegetation. The primary constituent elements include riparian vegetation and insects.

Western yellow-billed cuckoo in the action area
Yellow-billed cuckoo habitat occurs at 23 APS power lines that cross multiple waterways on Forest Service-administered lands (Coconino, Prescott, Tonto, and Apache-Sitgreaves National Forests) in the action area (Tables 7 and 8). Overall, the total amount of cuckoo habitat occurring within the action area is 53.63 acres within 7.72 miles of ROW.

Surveys have detected yellow-billed cuckoos or cuckoos have a high probability of occurring on multiple waterways within the action area that APS power lines cross (Table 7). However, the existing conditions within these power line ROWs do not provide suitable breeding habitat for yellow-billed cuckoos and the habitat would never attain characteristics of breeding habitat while APS manages the vegetation to minimize interference with power lines. Cuckoos may breed along the wooded riparian edge adjacent to the power line openings. Migratory cuckoos are known or likely to occur on all of the identified waterways and we expect them to occur briefly along these ROWs, and cuckoos nesting near these ROWs may use these areas for foraging. Many locations encroach on proposed critical habitat away from the stream channel or run parallel to the channel. In several locations, power lines span the drainage high enough to provide adequate clearance between riparian vegetation and the power line. Additionally, some of the lines are underground where vegetation treatments are not proposed. Therefore, APS will not treat vegetation in 27.99 acres of ROW and the area where vegetation maintenance activities may occur is 25.64 acres.

Western yellow-billed cuckoo proposed critical habitat in the action area
Seventeen of the 23 power lines fall within proposed yellow-billed cuckoo critical habitat, totaling 45.74 acres within 7.04 miles of ROW (Table 7). These locations occur along the Verde and Salt Rivers, Wet Beaver, Oak, Pinal, Pinto, Tonto, Cherry, Ash, Little Ash, Sycamore, Rye and West Clear Creeks. Not all ROWs span river or stream channels. The proposed action identifies a total of 19.68 acres of proposed cuckoo critical habitat where vegetation maintenance activities may occur. The primary constituent elements identified for proposed yellow-billed cuckoo critical habitat contain riverine processes and functions that help to generate the vegetation and insects that cuckoos rely upon.

Mexican spotted owl in the action area
The action area includes APS transmission and distribution power lines with a total of 18.69 miles and 95.27 acres that transect Mexican spotted owl Protected Activity Centers (PACs) and an additional 92 miles and 688.36 acres of power line ROW within 0.25 mile of PAC boundaries on NFS lands (Coconino, Kaibab, Prescott, Tonto, and Apache-Sitgreaves National Forests) in Arizona. Power lines intersect with 39 Mexican spotted owl PACs and are within 0.25 mile of 23 additional PACs. Fifteen DSAP poles occur within Mexican spotted owl PACs. The power line ROWs account for 0.03% of habitat within PACs on NFS lands in Arizona. We assume

owls occupy all PACs by definition. The action area includes 697.23 miles of power line, 497.06 acres of power line ROW, and 828 DSAP poles within Mexican spotted owl recovery habitat. The APS power lines comprise 0.13% of the 4,205,660 acres of recovery habitat found on NFS lands under this consultation.

Mexican spotted owl critical habitat in the action area
The action area includes 251.25 miles of power line, 2,283.56 acres of power line ROW, and 261 DSAP poles within Mexican spotted owl designated critical habitat. The power line ROWs account for 0.41% of the 551,018.4 acres of critical habitat on the five National Forests.

Narrow-headed gartersnake in the action area
Within the action area, we consider the narrow-headed gartersnake extant in the East Verde and Verde rivers, and Haigler, Houston, Tonto, Oak, and West Fork Oak Creeks on the Apache-Sitgreaves, Coconino, Prescott, and Tonto National Forests. Survey data indicate that at several of these sites, the species exists at low to very low densities and many populations may not be viable. In most localities where the species may occur at low population densities, existing survey data are insufficient to conclude that extirpation has occurred. Oak Creek supports the most robust and well-studied population of narrow-headed gartersnakes in Arizona. A detailed account of historic records, recent detections, and population status of the narrow-headed gartersnake in the action area can be found in the final Service Biological Opinion for the Phase II Maintenance Activities (file number: 22410-2006-F-0365-R3; USFWS 2018). We include the information provided in that document herein by reference.

Narrow-headed gartersnake proposed critical habitat in the action area
A total of 37.68 miles of overhead and underground power line and 168.88 acres of power line ROW occur within proposed critical habitat for narrow-headed gartersnakes (Table 9). Of 210,189 total acres of proposed critical habitat for this species, 61,364 acres occur on Forest Service-administered lands in Arizona. APS power line ROWs contain 0.28% of proposed critical habitat for narrow-headed gartersnakes in the action area. Some miles of power line ROW do not contain suitable habitat for narrow-headed gartersnakes and some power lines do not require maintenance activities in suitable habitat besides aerial inspections. The total acres of power line in suitable proposed critical habitat where some type of maintenance activities (besides aerial inspection) could occur is 157.82 acres. We assume that narrow-headed gartersnakes occupy these areas.

Northern Mexican gartersnake in the action area
Within the action area, the northern Mexican gartersnake is known to occur in portions of the Verde River and Little Ash, Tonto, Oak, and Spring creeks on the Coconino, Prescott, and Tonto National Forests. The Verde River, Oak Creek (Page Springs and Bubbling Ponds State Fish Hatcheries), and Tonto Creek populations are considered viable. At other locations where the species may occur at low population densities, existing survey data are insufficient to conclude that extirpation has occurred. A detailed account of historic records, recent detections, and population status of the northern Mexican gartersnake in the action area can be found in the final Service Biological Opinion for the Phase II Maintenance Activities (file number: 22410-2006-F-0365-R3; USFWS 2018) . We include the information provided in that document herein by reference.

Northern Mexican gartersnake proposed critical habitat in the action area
A total of 23.54 miles of power line and 116.79 acres of power line ROW occur within proposed critical habitat for northern Mexican gartersnake (Table 10), representing 0.43% of proposed critical habitat on NFS lands in Arizona. The Service proposed a total of 421,423 acres of critical habitat for this species in Arizona and New Mexico. Some miles of power line ROW do not contain suitable habitat for northern Mexican gartersnakes and some power lines do not require maintenance activities in suitable habitat besides aerial inspections. The total acres of power line in suitable proposed critical habitat where some type of maintenance activities (besides aerial inspection) could occur is 105.73 acres. We assume the northern Mexican gartersnake occupies these areas.

Previous consultations

Beginning in 2007, we conducted multiple section 7 consultations (including reinitiations and an emergency consultation) on hazard and vegetation maintenance along APS and SRP ROWs within the Apache-Sitgreaves, Coconino, Kaibab, Prescott, and Tonto National Forests. The consultations were: Phase I Hazard Vegetation Removal in Utility Corridors on Arizona Forests (22410-2007-F-0364); Phase II Phase II Utility Maintenance in Utility Corridors on Arizona Forests (22410-2007-F-0365; 22410-2007-F-0365 R1; 22410-2007-F-0365 R2; and 22410-2007-F-0365 R3); and Emergency Hazard Vegetation Treatment in Utility Corridors on Arizona Forests (22410-2006-FE-0318).

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.

Southwestern willow flycatcher

Overview
APS will implement conservation measures that limit the duration of work and minimize effects from herbicide applications. In addition, vegetation within the proposed action area does not reach mid-seral or mature status because of these and other activities. Therefore, we do not anticipate any adverse direct or indirect effects to individual flycatchers. Although flycatchers occur in appropriate habitat throughout the action area, there are no known nesting flycatchers within or along the edge of the specific ROWs included in the proposed action because of the long-term management of the ROWs for early-successional conditions.

We anticipate the proposed action is likely to affect adversely up to 12.85 acres of southwestern willow flycatcher critical habitat from ongoing removal and suppression of vegetation to

maintain safe ROWs. Within the project area, all suitable habitat falls within designated critical habitat. Vegetation removal and suppression is most likely to occur within a smaller area of critical habitat (6.57 acres), of which 5.09 acres is riparian vegetation. We expect the proposed action to prevent the growth of essential riparian habitat (PCEs) that flycatchers require for cover, shelter, breeding, migrating, dispersing, and foraging throughout the life of the project.

Direct effects
We do not anticipate direct effects to breeding or migrating flycatchers from aerial and ground inspections, vegetation maintenance and disposal, herbicide treatments, DSAP treatments, routine line maintenance, or repair of access routes. No flycatchers are known to breed within the ROWs being treated and are not expected throughout the life of the project, because riparian vegetation has previously been removed at these locations and because the proposed action is expected to prevent riparian vegetation from developing at these locations in the future.

We do not expect that noise and habitat disruption from aerial inspection of transmission or distribution lines conducted annually will affect nesting or migratory flycatchers to the extent that they would lead to direct adverse effects. We do not know of or expect any nesting flycatchers in the future within ROWs associated with the action area. It is possible that nearby breeding, foraging, or migratory flycatchers could occur at ROWs when helicopters pass over flycatcher habitat. However, because of the short duration of helicopter effects (noise and wind) and their infrequent occurrence, we expect the effect from disrupting flycatcher behavior would be insignificant. APS LIDAR helicopters can fly 300 to 1000 feet AGL, but are typically at 500 feet AGL. Additionally, APS proposes to not land helicopters for refueling within 0.25 mile of southwestern willow flycatcher occupied breeding habitat during the nesting season. As a result, we anticipate any disturbance caused to breeding southwestern willow flycatchers because of LIDAR flights to be short in time and duration, and small in intensity, and would likely represent isolated and not repeated events. Therefore, we anticipate any direct effects from disturbance to breeding flycatchers will be insignificant.

Four overhead power lines may receive routine vegetation maintenance within the ROW within habitat for southwestern willow flycatchers: CU 06, HD 02, MZT06, and QS 02. The underground portion of MZT06 would not receive routine vegetation maintenance treatments. The 500-3 and NW-02 power lines are high enough above vegetation that vegetation maintenance is not anticipated. A total of 6.57 acres of power line ROW occur within designated critical habitat for this species where routine vegetation maintenance using hand or mechanical methods may occur. Routine vegetation maintenance and disposal treatments at ROWs within flycatcher habitat will occur outside of the flycatcher breeding season (May 1 to August 31), which also includes much of the migratory breeding season. In addition, APS would not be using mechanical treatment methods within the floodplain of any stream or river system, including those with flycatcher habitat. As a result, it is unlikely that disturbance from routine vegetation treatments will occur to breeding or migrating flycatchers. Any potential disruption to migratory flycatcher behavior from routine vegetation treatments would be infrequent and of short duration due to the activities avoiding much of the migratory season and the limited amount of acreage requiring treatment. As a result, we expect that direct effects will be insignificant.

Because of the unpredictable nature of some hazard, line maintenance problems and hazard vegetation, treatment is often required as soon as possible (e.g., to prevent fire, retain line safety, deliver power). Although we expect that the need and frequency of hazard vegetation treatment and disposal to be low, these treatments could occur during the southwestern willow flycatcher-breeding season. APS identified the CU 06, HD 02, and QS 02 distribution power lines, which have suitable breeding habitat, as the most likely areas where hazard vegetation treatment would occur. These power lines include 0.61 mile of power line and 1.49 acres of power line ROW over 10 locations where hazard vegetation treatment and disposal may occur in flycatcher habitat. Surveys have not detected breeding flycatchers within the ROWs most likely to receive hazard treatments. We do not expect breeding flycatchers in these areas over the life of the project because APS (or others) previously removed riparian vegetation at these locations. Any potential disruption to the behavior of nesting, migrating, or foraging flycatchers occurring outside of the ROWs would be infrequent and of short duration. Additionally, hazard vegetation removal and disposal will affect a small area and typically consists of cutting a single tree or small group of trees. As a result, we expect direct effects of hazard tree removal and disposal to flycatchers will be insignificant.

A total of 6.57 acres of power line ROW occur within flycatcher habitat where herbicide applications may occur. The expected timing of most herbicidal treatment activities will be outside of the breeding season, avoiding potential disruption of flycatcher foraging, dispersing, migratory, or nearby breeding activity. Although APS may need to conduct herbicide treatments during the breeding season, such treatments will be limited to the maximum extent practicable. Due to the lack of mid-seral or mature flycatcher breeding habitat at these ROWs combined with the limited amount of acreage requiring treatment, we expect disruption of flycatcher breeding activities would be infrequent and of short duration due to herbicide treatments, and as a result, direct effects would be insignificant.

We do not expect herbicide treatments to occur during the breeding season and most of the migratory season, but the proposed action identifies the possibility that ROWs in flycatcher habitat may require herbicide treatment during the breeding and migratory seasons. Because crews will conduct these treatments with drip and drift controls and at ground level, there is virtually no risk of directly applying herbicides to flycatchers because the birds do not occur in these cleared areas, they typically perch and forage higher in the canopy of mid-seral and mature riparian trees, and they tend to avoid areas of human activity. As a result, we do not expect direct effects to flycatchers from herbicide applications.

Six poles that may receive DSAP treatment, totaling 0.04 acres, occur within critical habitat for the southwestern willow flycatcher. All six poles are located in upland habitat. These treatments would occur outside the breeding season for the flycatcher, crews previously cleared vegetation around these poles, and the proposed herbicide treatments would reduce the frequency of disturbance by field crews. As a result, we do not expect DSAP treatments to result in direct effects to flycatchers.

We anticipate that routine (non-hazardous) line maintenance work would have no direct effects on breeding flycatchers because APS plans these activities to occur outside of the flycatcher-breeding season. However, these activities may startle or flush flycatchers during migration or

foraging. We anticipate these incidents to be rare in occurrence because treatment in riparian areas is likely rare, and short in duration because flycatcher use of migratory habitat is temporary. As a result, we anticipate that the direct effect from rare and short duration disturbance to migrating flycatchers from non-hazardous line maintenance crews will be insignificant.

Line maintenance work could occur during the breeding season under hazard situations to make necessary repairs to power line infrastructure. This work is generally located at the power poles or along underground lines and the area around the poles is not suitable for breeding flycatchers. However, breeding flycatchers could occur outside the ROW in adjacent vegetation. There are 36 power poles and 0.31 acres of underground power lines within suitable habitat, although the underground line is located along a dirt road that is not suitable habitat. Vehicle activity approaching and exiting flycatcher habitat during the breeding season to conduct hazard line maintenance may startle or surprise flycatchers outside of their nest area, but these incidents are anticipated to be rare in occurrence and of short duration. Therefore, we anticipate noise disturbance to flycatchers caused by vehicles to be insignificant. Hazard repairs to power lines do not occur frequently but generally require loud equipment that may startle breeding flycatchers if present. The length of time crews may work to complete this work is unpredictable and could last less than a day to multiple days or weeks. No flycatchers are known to breed within the ROWs included in the proposed action, and the likelihood of nesting flycatchers near the 36 poles or underground line is low. Any potential disruption to the behavior of nesting, migrating, or foraging flycatchers occurring outside of the ROWs would be infrequent and of short duration. Therefore, we expect that line maintenance work will have insignificant direct effects on flycatchers.

Access Route maintenance may occur on a very limited basis to facilitate access to power line ROWs, allow for safe access, or to repair damage caused by accessing the ROWs. Access routes generally occur within or near power line ROWs or along established roads or access points. While it is unknown exactly where these actions will occur, it is highly unlikely that access route repairs would be required near a flycatcher-breeding site during the breeding season, and therefore we anticipate that direct effects to flycatchers are discountable.

Indirect effects

Because of the height of helicopter flights and the short duration near habitat, we do not anticipate that aerial inspection or LiDAR flights will damage or alter flycatcher habitat, including prey conditions. We also do not anticipate that ground patrols and inspections will result in adverse effects to southwestern willow flycatchers, as vehicles associated with ground patrols will stay on existing two-track roads within the floodplain within known flycatcher nesting habitat. Off-road vehicle use is restricted to within ROW corridors during ground inspections. As a result, we do not anticipate indirect effects to the flycatcher and its habitat or prey from these activities.

Routine vegetation treatment and disposal will remove and continue to suppress riparian vegetation in areas where flycatchers could potentially nest, forage, rest, and use at four ROWs across Forest Service-administered lands, totaling 6.57 acres. These ROWs occur in the Gila, Roosevelt, and Verde Management Units described in the Recovery Plan, where we have

established numerical and habitat-related goals (USFWS 2002). We do not expect the removal of this habitat to be temporal, because the goal of the project is to prevent riparian trees from reaching the mid-seral and mature status for the life of the power line systems. The acreage of suitable habitat effected is relatively minor when compared to the overall abundance and dynamic nature of riparian vegetation in Arizona and these management units. However, the amount is measurable because of the long-term nature and goals of the project. As result, we conclude that the removal of flycatcher habitat and long-term maintenance of these ROWs within flycatcher management units where numerical and habitat-related goals exist results in an overall adverse effect to the flycatcher's recovery.

The amount of riparian vegetation that APS may remove because of hazard vegetation treatment and disposal will be minimal within riparian corridors. Hazard vegetation is typically a single tree or small clump of trees outside the maintained ROW. Because these treatments would be infrequent, localized, and would occur in a small area over a short period, we anticipate that hazard vegetation treatments would have an insignificant effect to the flycatcher and its overall habitat and prey conditions.

We do not anticipate any indirect effects to breeding or migrating flycatchers from herbicide treatment, in particular the secondary poisoning of flycatchers from consuming poisoned insects. Stipulations for herbicide treatment will prevent using maximum levels of glyphosate, hexazinone, and triclopyr, will not use 2,4-D, and will appropriately limit the class and toxicity of herbicides. Crews will manually apply herbicides with spot treatments of specific individual plants. These herbicidal controls and manual application to individual plants will prevent the spraying of insects that flycatchers rely upon, and as a result, we anticipate any indirect effects associated with herbicide applications will be insignificant.

Six poles that may receive DSAP treatments, totaling 0.04 acre, occur near southwestern willow flycatcher habitat. However, all six poles are located in upland habitat, treatments occur only in the immediate area surrounding the pole, and none of the DSAP treatment poles occurs within southwestern willow flycatcher riparian habitat. As a result, we anticipate that indirect effects to the flycatcher and its habitat or insect prey will be insignificant.

We also do not anticipate line maintenance or repair of access routes will alter flycatcher habitat or insect prey, as these activities repair the actual power line structures and routes, and do not affect habitat components.

Critical habitat

Within the action area, six power lines intersect with southwestern willow flycatcher critical habitat at 20 locations (Table 6). The power lines within designated critical habitat cover a distance of 3.07 miles and 12.85 acres of power line ROWs. APS calculated total ROW acres using the maximum ROW width. Therefore, this is a liberal estimate of the actual acres that APS may treat because the proposed action includes selective vegetation treatments, herbicide application to individual plants, and line maintenance repairs. Additionally, at many areas there is no need for hazard or non-hazard vegetation treatment in riparian areas. In some instances, power lines span streams or rivers high enough to provide adequate clearance distance between riparian vegetation and the power line, and treatments are unnecessary.

We do not anticipate adverse effects to flycatcher critical habitat from aerial and ground inspections, DSAP treatments, routine line maintenance, or repair of access routes, as these activities will not alter flycatcher designated critical habitat.

The goal of the project is to maintain cleared ROWs for power lines through manual and herbicide treatments and maintenance, and as a result, those goals will result in the removal and long-term suppression of riparian species (e.g., cottonwood, willow, tamarisk) that flycatchers rely upon and are identified as PCEs of designated critical habitat. Routine vegetation treatments and herbicide applications will occur within 6.57 acres (at 17 locations) of flycatcher critical habitat; 5.09 acres of this APS will continuously clear of vegetation. We anticipate the removal and continued treatment of this vegetation to be an adverse effect to riparian plant species and insects identified as the PCEs of designated flycatcher critical habitat.

Areas where hazard vegetation is most likely to occur include 0.61 mile of power line and 1.49 acres of ROW at 10 locations. APS has maintained power line ROWs, as low-growing, early seral stage riparian vegetation, and thus treatment of hazard vegetation in the ROW is uncommon. However, hazard vegetation, as a single tree or small clump of trees, may occur outside the maintained area. Hazard vegetation treatments would be small in area, localized, and infrequent, and would occur immediately adjacent to the maintained ROW. Therefore, we anticipate hazard vegetation treatments would have a minor effect on PCE 1 of flycatcher critical habitat. Given the small scale and infrequency of hazard treatments, we anticipate effects to insect prey (PCE 2) will be insignificant.

Herbicidal treatments to riparian trees at ground level could potentially effects insects, but because of the targeted and manual application of herbicides with low toxicity and drip-drift controls, we do not anticipate the herbicide application to measurably affect insects.

From APS preventing the growth and establishment of riparian plant species within a maximum of 12.85 acres of flycatcher critical habitat, we anticipate adverse effects to the physical and biological features focused on the development of riparian plants. However, because of the relatively small amount of riparian habitat being affected, and the overall dynamic and patchy presence of riparian vegetation, we do not anticipate the removal and continued suppression of approximately 5.09 acres of riparian vegetation within 12.85 acres of designated critical habitat to effect the broader physical or biological features of critical habitat associated with water, soils, groundwater, and river flow, or the growth and establishment of riparian habitat elsewhere outside of the ROWs.

Overall, the 12.85 acres of flycatcher critical habitat potentially affected by the proposed project is a small fraction (0.09%) of the overall amount of critical habitat within the action area (13,541.85 acres). Additionally, the amount of riparian vegetation potentially affected by the proposed project (5.09 acres) is an even smaller fraction (0.03%) of flycatcher critical habitat within the action area.

Western yellow-billed cuckoo

Overview
We know that cuckoos occur within the action area; however, their occurrence within the specific ROWs included in the proposed action is unlikely because of the long-term maintenance of the ROWs for early-successional conditions. Because of implementing conservation measures limiting duration of time conducting work and minimizing effects from herbicide application combined with the lack of vegetation reaching mid-seral or mature status from the proposed action, we do not anticipate any direct or indirect adverse effects to individual cuckoos.

We anticipate the proposed action is likely to adversely affect western yellow-billed cuckoo proposed critical habitat from ongoing removal and suppression of vegetation to maintain safe ROWs, across a maximum of 45.75 acres of proposed critical habitat and 7.88 acres of habitat outside of proposed critical habitat. We expect the proposed action to prevent the growth of essential riparian habitat that cuckoos require for cover, shelter, breeding, migrating, dispersing, and foraging throughout the life of the project.

Direct effects
We do not anticipate direct adverse effects to breeding or migrating cuckoos from aerial and ground inspections, vegetation maintenance and disposal, herbicide treatments, DSAP treatments, routine line maintenance, or repair of access routes. It is possible that cuckoos may breed adjacent to ROWs, but we do not know of or expect cuckoos to nest within the footprint of the ROWs because APS previously removed riparian vegetation at these locations and continued management will prevent vegetation from developing in the future.

Noise and habitat disruption from aerial inspection of transmission or distribution lines conducted annually will not affect nearby nesting or migratory cuckoos to the extent that adverse effects occur. Nearby breeding, foraging, or migratory cuckoos may occur at ROWs when helicopters pass over cuckoo habitat. However, because of the short duration of helicopter effects (noise and wind) and their infrequent occurrence, we expect the effect from disrupting cuckoo behavior would be insignificant. APS LIDAR helicopters can fly 300 to 1000 feet AGL, but are typically at 500 feet AGL. Additionally, APS proposes to avoid landing helicopters for refueling within 0.25 mile of western yellow-billed cuckoo occupied breeding habitat during the nesting season (May 1 to September 30). As a result, any disturbance caused to breeding cuckoos because of LIDAR flights we anticipate to be short in time and duration and low in intensity, and would likely represent isolated and not repeated events. Therefore, we anticipate any direct effects to breeding cuckoos from aerial inspection will be insignificant.

Routine vegetation maintenance and disposal treatments at ROWs within cuckoo habitat will occur outside of the cuckoo breeding season, which also includes part of the migratory season. In addition, APS will not be using mechanical treatment methods within the floodplain of any stream or river system, including those with cuckoo habitat. As a result, it is unlikely that disturbance from routine vegetation treatments will occur to breeding or migrating cuckoos. Any potential disruption to migratory cuckoo behavior from routine vegetation treatments would be infrequent and of short duration because the activities will avoid part of the migratory season and the limited amount of acreage requiring treatment, and as a result we expect any direct effects to be insignificant.

Because of the unpredictable nature of some hazard line maintenance and hazard vegetation, treatment is often required as soon as possible (e.g., to prevent fire, maintain line safety, deliver power). Although we expect the need and frequency of hazard vegetation treatment and disposal to be low, these treatments could occur during the western yellow-billed cuckoo breeding season. The CN 02, CU 06, MG10, and QS 10 power lines have breeding cuckoo habitat and APS identified these lines as the most likely areas where hazard vegetation treatment would occur. These power lines include 1.32 acres of power line ROW where hazard vegetation treatment and disposal may occur in cuckoo habitat. It is possible that cuckoos may breed along the wooded edge of ROWs, but no cuckoos are known to nest or expected to nest in the future within the ROWs most likely to receive hazard treatments because riparian vegetation has previously been removed at these locations. Although it is possible that the removal of a hazard tree adjacent to the ROW could result in loss or abandonment of a nest. However, the probability of such an occurrence is very low. Any potential behavior disruption to nesting, migrating, or foraging cuckoos occurring outside of the ROWs would be infrequent and of short duration. Additionally, hazard vegetation removal and disposal will affect a small area and typically consists of cutting a single tree or small group of trees. As a result, we expect direct effects of hazard tree removal and disposal to cuckoos will be insignificant.

A total of 6.72 acres of power line ROW occur within cuckoo breeding habitat where herbicide applications may occur. The expected timing of most herbicidal treatment activities will be outside of the breeding season, avoiding potential disruption of cuckoo foraging, dispersing, migratory, or nearby breeding activity. However, APS may need to occasionally conduct herbicide treatments during the breeding season, but will limit the duration and number of visits. The lack of mid-seral or mature cuckoo breeding habitat at these ROWs prevents reliance of these ROWs for breeding and foraging activities by cuckoos, and combined with the limited acreage requiring treatment, any disruption of cuckoo breeding activities from herbicide treatment would be expected to be infrequent and of short duration. As a result, direct effects would be insignificant.

We do not expect herbicide treatments to occur during the cuckoo breeding season and part of the migratory season, but the proposed action identifies the possibility that ROWs in cuckoo habitat may require herbicide treatment during the breeding and migratory seasons. Because these treatments will occur manually (with drip and drift controls) and at ground level, there is virtually no risk of directly applying herbicides to cuckoos because cuckoos are not expected to occur at these cleared areas, typically perch and forage higher in the canopy of mid-seral and mature riparian trees, and would be expected to avoid areas of human activity. As a result, herbicidal applications will not directly affect by cuckoos.

Ten poles that may receive DSAP treatment, totaling 0.07 acres, occur near cuckoo habitat. All 10 poles are located in upland habitat, not in riparian habitat. These treatments would occur outside the cuckoo-breeding season, APS previously cleared vegetation around these poles using manual methods, and the proposed herbicide treatments would reduce the frequency of disturbance by field crews. As a result, DSAP treatments will not directly affect cuckoos.

Routine (non-hazardous) line maintenance work will have no direct effects on breeding cuckoos because these APS will conduct these activities outside of the cuckoo breeding season.

However, these activities may startle or flush cuckoos during migration or foraging. These incidents are anticipated to be rare in occurrence and short in duration because treatment in riparian areas is not commonly anticipated to occur and use of migratory habitat by cuckoos is temporary. As a result, we anticipate that the direct effect from rare and short duration disturbance from non-hazardous line maintenance crews to migrating or foraging cuckoos will be insignificant.

Line maintenance work could occur during the cuckoo breeding season under hazard situations to make necessary repairs to power line infrastructure. This work is generally located at the power poles or along underground lines and the area around the poles is not suitable for breeding cuckoos. However, breeding cuckoos could occur outside the ROW in adjacent vegetation. There are 75 power poles and 0.88 acres of underground power lines within cuckoo habitat. Vehicle activity approaching and exiting cuckoo habitat during the breeding season conducting hazard line maintenance may startle or surprise cuckoos outside of their nest area, but we anticipate these incidents to be rare in occurrence and of short duration. Therefore, any disturbance to cuckoos caused by vehicles will be insignificant.

Hazard power line repairs do not occur frequently but generally require loud equipment that may startle breeding cuckoos if present. The length of time needed to complete work is unpredictable and could last less than a day to multiple days or weeks. No cuckoos are known to breed within the ROWs included in the proposed action, and the likelihood of nesting flycatchers near the 75 poles or underground line is low. Any potential disruption to the behavior of nesting, migrating, or foraging cuckoos potentially occurring outside of the ROWs would be infrequent and of short duration. Therefore, we expect that line maintenance work will have insignificant direct effects to cuckoos.

Access route maintenance may occur on a very limited basis to facilitate access to power line ROWs, allow for safe access, or to repair damage caused by accessing the ROWs. Access routes generally occur within or near power line ROWs or along established roads or access points. While it is unknown exactly where these actions will occur, it is highly unlikely that access route repairs would be required near a cuckoo breeding site during the breeding season, and therefore we anticipate that direct effects to cuckoos from route maintenance are discountable.

Indirect effects

A total of 0.68 miles of power lines and 7.88 acres of ROWs occur within cuckoo habitat outside of critical habitat. Because of the height of helicopter flights and the short duration near cuckoo habitat, we do not anticipate that aerial inspection or LiDAR flights will damage or alter cuckoo habitat, including prey conditions. We also do not anticipate that ground patrols and inspections will result in adverse effects to western yellow-billed cuckoos. Vehicles associated with ground patrols will stay on existing two-track roads within the floodplain within known cuckoo nesting habitat. Off-road vehicle use is restricted to within ROW corridors during ground inspections. As a result, we do not anticipate adverse effects to cuckoos or their habitat from these activities.

Routine vegetation treatment and disposal will remove and continue to suppress riparian vegetation in areas where cuckoos could nest, forage, and rest across Forest Service-administered lands, totaling 6.72 acres. We expect that the habitat removal will be permanent, because the

goal of the project is to prevent riparian trees from reaching the mid-seral and mature status for the life of the power line systems. The acreage of cuckoo habitat effected is relatively minor when compared to the overall abundance and dynamic nature of riparian vegetation in Arizona. However, because of the long-term nature and goals of the project these habitat effects will be permanent. As result, we conclude that the removal of cuckoo habitat and long-term maintenance of these ROWs results in an overall adverse effect to cuckoo habitat.

We anticipate that the amount of cuckoo habitat removed will be minimal within riparian corridors because of hazard vegetation treatment and disposal. Hazard vegetation is typically a single tree or small clump of trees outside the maintained ROWs. Because these treatments would be infrequent, localized, and would occur in a small area over a short period of time, we anticipate that hazard vegetation treatments would have an insignificant effect to the cuckoo and its habitat and prey.

We do not anticipate any indirect effects to breeding or migrating cuckoos from herbicide treatment, in particular the secondary poisoning of cuckoos from consuming poisoned insects. Stipulations for herbicide treatment will prevent using maximum levels of glyphosate, hexazinone, and triclopyr, will not use 2,4-D, and will appropriately limit the class and toxicity of herbicides. Crews will manually apply herbicides with spot treatments of specific individual plants. These herbicidal controls and manual application to individual plants will prevent the spraying of insects that cuckoos rely upon, and as a result, we anticipate any indirect effects associated with herbicide applications will be insignificant.

Ten poles, totaling 0.07 acres, may receive DSAP treatment near cuckoo habitat. No DSAP treatment will occur within riparian habitat. As a result, we anticipate that indirect effects to the cuckoo and its habitat and prey will be insignificant.

We also do not anticipate alteration of cuckoo habitat or prey populations to result from line maintenance or repair of access routes, as this action involved repair of the actual power line structures and routes, and not vegetation treatments.

Proposed critical habitat

Within the action area, western yellow-billed cuckoo proposed critical habitat is intersected by a total 7.04 miles of power lines and 45.75 acres of power line ROWs. APS calculated total ROW acres using the maximum ROW width, so the acreage is likely an overestimate. In addition, selective vegetation, herbicide, and line repair work will further reduce the project footprint. Additionally, at many areas there is no need for hazard or non-hazard vegetation treatment in riparian areas. In some instances, power lines span streams or rivers high enough to provide adequate clearance distance between riparian vegetation and the power line, and treatments are unnecessary.

We do not anticipate adverse effects to cuckoo proposed critical habitat from aerial and ground inspections, DSAP treatments, routine line maintenance, or repair of access routes, as these activities will not alter the PCEs of cuckoo proposed critical habitat.

The goal of the project is to maintain cleared ROWs for power lines through manual and herbicide treatments and maintenance, and as a result, those goals will result in the removal and long-term suppression of riparian woodlands that cuckoos rely upon and the Service identified as PCEs of proposed critical habitat. APS expects that routine vegetation treatments and herbicide applications would occur within 9.19 acres of cuckoo proposed critical habitat. We anticipate that the removal and continued treatment of this vegetation will result in adverse effects to riparian plant species (PCE 1) and insect prey (PCE2) that rely upon vegetation identified as a PCE of proposed yellow-billed cuckoo critical habitat. Because of the relatively small amount of habitat affected and the overall dynamic and patchy presence of riparian vegetation, we anticipate the proposed action will have an insignificant effect to dynamic riverine processes (PCE 3).

There are approximately 1.31 acres of ROWs in which hazard vegetation is most likely to occur within proposed cuckoo critical habitat. APS maintained vegetation within power line ROWs, as low-growing, early seral stage riparian vegetation, and thus treatment of hazard vegetation in ROWs is uncommon. However, hazard vegetation, as a single tree or small clump of trees, may occur outside the maintained area. Hazard vegetation treatments would be small in area, localized, infrequent, and would occur immediately adjacent to the maintained ROWs. Therefore, we anticipate hazard vegetation treatments would have a minor adverse effect to PCE 1 of cuckoo proposed critical habitat. Given the small scale and infrequency of hazard treatments, we anticipate effects to insect prey (PCE 2) or riverine processes (PCE 3) will be insignificant.

Herbicidal treatments to riparian trees at ground level could potentially affect prey availability (cuckoo proposed critical habitat PCE 2), but because of the targeted and manual application of herbicides with low toxicity and drip-drift controls, we anticipate any effect from herbicide application will be insignificant.

Overall, the 45.75 acres of cuckoo proposed critical habitat potentially affected by the proposed project is a small fraction (0.33%) of the overall amount of proposed critical habitat within the action area (14,007.39 acres). Because APS will prevent the growth and establishment of riparian plant species within a maximum of 45.75 acres of cuckoo proposed critical habitat, we anticipate adverse effects to the physical and biological features focused on the development of riparian plants. However, because the actual amount of riparian habitat affected is likely to be significantly less than 45.75 acres, we do not anticipate the removal and continued suppression of these areas will affect the broader features of proposed critical habitat associated with prey populations or dynamic riverine processes (e.g., sediment movements and deposits that encourage seedling germination and plant development), or the growth and establishment of riparian woodlands elsewhere outside of the ROWs.

Mexican spotted owl

Overview
We anticipate adverse effects to Mexican spotted owls from ongoing habitat modification and disturbance associated with the combination of aerial and ground patrols in 16 PACS during the 20-year period of the proposed action. We anticipate the proposed conservation measures will help to reduce adverse effects to Mexican spotted owls for much of the proposed action. However, because of the overall goals of the project and the necessary methods, we determined that minimization measures will not remove adverse effects and that these effects are reasonably certain to occur.

We anticipate the proposed action is likely to adversely affect Mexican spotted owl designated critical habitat from ongoing removal and suppression of vegetation to maintain safe ROWs, across a maximum of 2,190 acres of designated critical habitat within the project area. There are 62 PACs within the action area, 39 of which power lines intersect, and 23 additional PACs where power lines do not intersect but are within 0.25 mile of the PAC. Of the 39 PACs with transecting power lines, five are underground power lines where vegetation treatments are not proposed. Vegetation maintenance treatments would occur in 34 PACs. The action area encompasses a total of 88.62 acres on which vegetation maintenance would occur within PACs. Of the 34 PACs potentially receiving vegetation maintenance treatments, 14 have overhead power lines that transect a portion of the PAC rather than occurring along the edge of the PAC (Table 11).

Direct effects
We anticipate noise from all air operations, especially low-flying aircraft, will result in disturbance to spotted owls. Low-level flights have the greatest potential to disturb owls because these aircraft move slowly and are relatively noisy (Delaney *et al*. 1997). Although the effects of over-flights may vary with location, specific conditions, and aircraft type, Delaney *et al*. (1999) found that a 345-feet hemispherical management protective zone should minimize, and possibly eliminate, spotted owl flush response and negative effects to prey delivery rates associated with helicopter overflights. The proposed action includes APS conducting one to three helicopter flights per year along utility lines, some of which may occur during the Mexican spotted owl-breeding season, at altitudes less than 345 feet and as low as 50 feet. The LiDAR flights would occur primarily at 500 feet above the ground, but occasionally may drop to about 300 feet, which is within the 345-foot hemispherical management protective zone. Sixteen PACs occur within 0.25 mile of transmission lines where aerial flights occur most often (see Table 22 in the BA), although aerial flights may also occur occasionally over any PACs intersected by or within 0.25 mile of distribution lines. Because APS helicopter flights can occur during the owl breeding season, we anticipate disruptions to incubation, breeding, and foraging spotted owls, which can lead to damaging or breaking eggs, as well as reduced foraging success and prey deliveries to incubating adults, fledglings, or nestlings. These disturbance effects are most likely in three PACs (Gentry, Volunteer, and Kelly PACs) where transmission lines intersect towards the center of the PAC rather than along the edge (Table 11).

Ground inspections may occur at any time of year for the purposes of hazard vegetation identification, routine vegetation maintenance planning, routine and hazard line maintenance

inspection, wood pole inspections and treatment, climbing inspections, underground line inspections, and auditing work. All of these patrols could occur during the Mexican spotted owl breeding season. We do not expect that ground patrols would startle or cause spotted owls to flush from the nest due to the short duration, low frequency, and low levels of noise from ground inspections. As a result, we anticipate direct effects to spotted owls associated with ground inspections would be insignificant and discountable.

Hazard vegetation is most likely to occur on the 230-2 and NW-5 transmission lines, and NP 01, SE 14, and PR 06 distribution lines in the following MSO PACs: Taylor Cabin, James Canyon, Kelly, Pumphouse Wash, and Sterling (see Table 74 in Appendix D of the BA). These areas have higher densities of dead or dying trees or higher historical incidence of hazard vegetation. Of these, the NW-5, NP 01, and PR 06 power lines transect rather than occur along the edge of the Kelly, Pumphouse Wash, Upper Gordon, and Turkey Peak Northwest PACs. Hazard vegetation trimming and removal treatments require two to six people and may take several hours to a couple of weeks to complete for a particular area. The shorter duration of work is most common. Chainsaw sound levels are from 106 to 117 dBA, which exceeds the sound level for flushing in response to disturbance (Delaney *et al.* 1997). It is unknown exactly where hazard vegetation may be trimmed or removed, but hazard vegetation could be trimmed or removed within any of the PACs with overhead transmission and distribution lines (see BA, Table 20) because the vegetation types associated with spotted owls also has the potential to pose a hazard to power lines. Effects associated with hazard vegetation treatments (including overhead and underground line maintenance), as described below, are most likely to occur in the Kelly, Pumphouse Wash, Upper Gordon, and Turkey Peak PACs.

Hazard line maintenance work for overhead and underground lines may be conducted at any time of year within PACs. This work typically requires two to four workers, but may require up to 15 people, and takes several hours to a couple of weeks to complete. The large line trucks (such as a large bucket truck, crane, or boom truck) may produce more noise than an ATV or 4x4 truck, but likely do not rise above 95 dBA. For underground lines, hazard repairs may require a backhoe or other digging equipment to dig up the line. Most of the underground lines have small sections of line in a given PAC, and are typically at the very edge of a PAC (see BA, Table 20). However, underground lines CQ-12 and STR02 transect through the middle of the Lockwood and Mormon Mountain PACs.

Mechanical noise and human presence during the breeding season near an owl may result in changed behavior and/or flushing from a perch or nest (Delaney *et al*. 1999a; Swarthout and Steidl 2001, 2003). These behavioral responses may alter nesting and roosting activities (USFWS 2012c). Noise disturbance within 315 feet of owl nests could affect prey delivery rates (Delaney *et al*. 1999b). Noise levels ≥ 69 dBA have a greater probability of causing owls to flush (Pater *et al*. 2009). Chainsaw sound levels are from 106 to 117 dBA and large line trucks may produce sounds of up to 95 dBA.

Because many hazard vegetation, hazard line maintenance problems, and underground cable repairs are considered “imminent” hazards, it is not possible to conduct all treatments outside of the Mexican spotted owl breeding season. For hazard situations that are not imminent but require treatment in the near future (such as off-cycle hazards), conservation measures would be

implemented as described above when possible to limit work within or near PACs and to reduce the duration of work and frequency of trips in and out of PACs. We anticipate that overall, hazard treatments (particularly hazard vegetation treatments) are likely have an adverse effect on the Mexican spotted owl. Adverse effects could include failed reproductive efforts, abandonment of the nest, or starvation. Noise disturbance is most likely to occur at the level of the individual owl and is most likely to occur to owls within the 16 PACs listed in Table 11 (total area of 52.67 acres). These 16 PACs have higher potential for disturbance because the power lines transect the PAC and could occur near the nest core.

Routine vegetation maintenance and non-hazardous line maintenance activities will avoid the use of equipment within PACs during the breeding season, and avoid the use of loud machinery within 0.25 mile of PACs during the breeding season. The goal is to limit noise levels at PAC boundaries to less than 69 dBA. These conservation measures ensure that no direct effects would occur to breeding Mexican spotted owls from routine vegetation maintenance and non-hazardous line maintenance treatments. Noise disturbance as described above may still affect spotted owls outside of the breeding season. However, we anticipate that these effects would be temporary and because they are outside the breeding season would not affect nesting or reproduction.

Disposal of vegetation occurs during hazard vegetation treatment and routine vegetation maintenance. Disposal associated with hazard vegetation removal may occur within 0.25 mile of a PAC during the Mexican spotted owl breeding season. The human traffic and chainsaw noise may cause noise disturbance as described above. We anticipate that this noise disturbance and the presence of humans during the breeding season could result in adverse effects to owls including failed reproductive efforts, nest abandonment, or starvation. Disposal activities for routine vegetation maintenance would occur outside of the breeding season within 0.25 mile of known PACs, avoiding direct effects to potentially breeding Mexican spotted owls.

Crews will apply herbicides to individual plants or small groups of plants, including new growth and regrowth of vegetation within the ROW. Because Mexican spotted owls are nocturnal birds, application occurs during the day, and owls are unlikely to come into contact with the type of vegetation being treated, there is virtually no chance that Mexican spotted owls would come in contact with herbicides either from direct application or from brushing against freshly sprayed vegetation. In addition, treatments would be restricted to outside of PACs during the breeding season for the 14 PACs with overhead power lines that transect the PAC rather than occurring at the edge of the PAC, further reducing the potential for spotted owls to come into contact herbicides. In addition, the low toxicity of the proposed herbicides ensures that, in the unlikely event that owl exposure to herbicide occurs, the herbicide would have an insignificant direct effect to the owl.

The use of ATVs for applying herbicides in a PAC during the breeding season would be restricted to existing roads that are open to the public. Owls nesting or roosting near these roads are regularly exposed to noise from passing vehicles or ATVs and would not likely be disturbed from the brief presence of the ATV as part of this project. Where road access is not available, crews would apply herbicides by walking in using a backpack sprayer. This action would occur outside of the breeding season for the 14 PACs with overhead power lines where the power lines

transect the PAC rather than occurring at the edge of the PAC. The chance of this specific project component disturbing owls during breeding is highly unlikely and discountable because the action is not likely to occur near a breeding bird. If a Mexican spotted owl were present in the area near herbicide application, then the owl would not likely be disturbed from the brief presence of people with spray equipment. It is unlikely that crews would encounter a foraging Mexican spotted owl because owls mostly forage from evening to dawn, whereas herbicide application occurs during the day. As a result, we anticipate direct effects of herbicide applications to Mexican spotted owls are insignificant.

APS may conduct access route repairs to gain access to a line using an existing access route. While it is unknown exactly where these actions would be located, this action is very infrequent and these activities would be subject to the breeding timing restrictions listed in the conservation measures. There is a small chance that access route repair may be required during the breeding season as part of hazard line maintenance work. This work would likely affect the same PACs as the hazard work. However, this action is unlikely to occur during the breeding season.

Indirect effects

There are 62 MSO PACs within the action area, of which power lines intersect 39, and 23 additional PACs where power lines do not intersect the PAC, but are within 0.25 mile of a PAC. Of the 39 PACs with transecting power lines, underground power lines transect five PACs where vegetation treatments are not proposed. Vegetation maintenance treatments would occur in 34 PACs. There are 88.62 PAC acres in the action area where vegetation maintenance work is proposed.

We establish PACs to include the best possible nest/roost habitat around a known owl site, as defined in the Recovery Plan (USFWS 2012a). This habitat often contains mature or old-growth stands of forest trees that are typically uneven-aged, multistoried, and have high canopy cover. Nest trees are typically large with an average of 24 inches dbh, although owls may nest and roost in large and small trees (USFWS 2012a).

Of the 34 PACs potentially receiving vegetation maintenance treatments, 14 have overhead power lines that transect a portion of the PAC rather than along the edge (Table 11). We are reasonably certain APS has removed trees within ROWs that transect these PACs during the last 10 years (USFS 2008a). APS must remove hazard vegetation, of any size, for safety purposes. Therefore, future maintenance of ROWs primarily involves the removal of new growth and regeneration within ROWs. Hazard vegetation outside of ROWs could potentially affect PAC habitat. Although the majority of vegetation treatments would involve the removal of saplings and young trees, there is the potential for APS to remove hardwoods, snags, and large diameter trees at the edge of or outside ROWs. Trees outside of ROWs would consist of snags and diseased or defective hazard trees. Removal of vegetation could reduce canopy cover, alter canopy structure, reduce and remove snags, and create openings. These habitat alterations involve a small portion of the surrounding habitat and are concentrated within a previously disturbed power line ROWs that differs from the surrounding habitat (i.e., power line ROWs continually managed to reduce vegetation). Additionally, no extensive clearing of the power line ROWs would be needed. While vegetation treatments could alter habitat vegetation within PACs, the change in habitat would be local, small in scale, and unlikely to result in negative

effects to habitat within these PACs. Vegetation treatments in the 14 PACs with overhead power lines transecting through the PAC and not at the edge of the PAC could result in adverse effects to owl habitat within these PACs.

While vegetation removal could decrease the overhead canopy within Mexican spotted owl habitat by removing tall growing vegetation (i.e., trees), the hazard vegetation removal would not directly alter understory cover and residual plant cover. Long-term maintenance of the ROWs will likely promote the development of herbaceous understory communities, which may benefit owl prey species. The abundance of downed logs would increase from vegetation removal and disposal, particularly in areas where APS is able to implement the conservation measure of leaving large logs whole at the edge of a ROW. The increased abundance of herbaceous vegetation and downed logs may result in beneficial effects to owl prey habitat.

Per the Recovery Plan (USFWS 2012a), the intention is that manager will maintain existing recovery habitat and develop a subset of the recovery habitat into nesting and roosting habitat. Forested recovery habitat includes mixed-conifer and pine-oak forests that owls do not currently occupy (i.e., suitable, unoccupied habitat). These forests typically include large trees, multi-storied canopy, high canopy cover, and decadence in the form of downed logs and snags. Many stands also include a prominent hardwood component. Vegetation management could occur along overhead power lines within approximately 5,278.91 acres of forested recovery habitat. It is highly unlikely that the ROWs currently contain vegetation for nesting or roosting habitat as APS has continually treated these areas during the last 10 years to maintain early-successional conditions. Continued maintenance of the ROWs will prevent the future development of suitable nesting and roosting habitat within these areas. Vegetation management associated with power lines would most likely involve the removal of trees greater than 18 inches dbh at the edge or outside of ROWs. APS may also remove these trees outside of a ROW as hazard vegetation (dead, dying, or diseased trees). However, the removal of vegetation may increase plant species diversity by managing ROWs for early seral species. Vegetation treatments may also involve the removal of large hardwoods. These trees are unlikely to occur in the ROW, but could occur as hazards outside of the ROWs. The removal of individual hardwoods, snags, and large trees could result in some changes to forested recovery habitat by removing important habitat components for the Mexican spotted owls and its prey. Overall, we anticipate that vegetation treatments from this point forward will not appreciably reduce the amount of Mexican spotted owl recovery habitat within the action area.

The proposed action includes 238.81 acres of riparian vegetation with habitat components suitable for riparian recovery habitat within overhead power line ROWs. This constitutes 0.21% of the total recovery riparian habitat on Forest Service-administered lands included in this consultation. The proposed action may result in removal of vegetation within suitable riparian recovery habitat. Riparian vegetation grows faster than surrounding upland vegetation and can be a risk to power lines. Conversely, power lines often span riparian areas with poles and towers on the ridges above the riparian area and power line wires high enough above vegetation that treatment of riparian vegetation in many areas is not needed. For this reason, effects would be localized and restricted to small areas where power lines intersect riparian vegetation. Therefore, we anticipate overall effects to Mexican spotted owl riparian recovery habitat will be insignificant.

Repair and replacement of existing power lines may be required within riparian recovery habitat, although this is unlikely because the majority of power line structures are located outside of riparian areas. As a result, we expect repair and replacement of power lines is unlikely to result in significant effects to MSO riparian recovery habitat. We also do not anticipate significant alteration of MSO habitat or prey populations from repair of access routes, as these activities are focused on repair of the actual routes and not vegetation treatments.

Herbicide treatments may occur within 88.62 acres of PAC habitat and 5,278.91 acres of recovery habitat within overhead power line ROWs. APS may apply herbicides associated with DSAP treatments at 15 pole locations within recovery habitat. Effects of herbicide applications would be similar to those from routine and hazard vegetation treatments, primarily the preclusion of Mexican spotted owl nesting and roosting habitat development within the ROWs. However, unlike mechanical or manual vegetation treatment methods, herbicide applications are spot treatments to select individual plants or small groups and are applied only within the ROW.

Small mammals, a prey species of Mexican spotted owls, are typically nocturnal and shelter in burrows or at the base of shrubs and trees during the day. Prey species that seek shelter under target vegetation may temporarily flee the area during herbicide applications, and there is a possibility that spotted owl prey could be exposed to herbicides. However, only herbicides of low toxicity to predatory birds would be used within Mexican spotted owl habitat. These herbicides are also of low toxicity to small mammals and will be spot applied directly to vegetation. Therefore, we anticipate that effects of herbicide applications on prey species, and indirectly to Mexican spotted owls, will be insignificant.

Critical habitat

A total of 277.94 miles of power line with 2,283.56 acres of ROWs occur within Mexican spotted owl critical habitat. Of this, 93.5 acres occur within underground power line ROWs, and 2,190.05 acres occur within overhead power line ROWs. The proposed action will not affect canyon habitat, as defined in the critical habitat rule (USFWS 2004). Therefore, we will not analyze the effects of this project on the PCEs of canyon habitat. We identified PCEs in the final rule designating critical habitat (USFWS 2004). The importance of each of these components to MSO habitat is described in the final rule (USFWS 2004) and the Recovery Plan (USFWS 1995). The information provided in those documents is included herein by reference. The expected effects on the PCEs of MSO critical habitat as a result of this utility corridor maintenance project are summarized below by forest structure and prey species habitat.

<u>Range of tree species and tree size</u>

In forested Mexican spotted owl critical habitat, a range of tree species and sizes, with 30 to 45% of the trees with a dbh of 12 inches or more is desired. Under the proposed action, the range of tree species and diameters would continue to be affected. For routine vegetation maintenance, all tall growing species and some lower growing species within 10 feet of poles, 40 feet of towers, and within the ROWs would be removed regardless of tree species. For hazard vegetation, only single trees or small clumps of trees that pose a hazard to the power line would be removed. However, because ROWs have been continually maintained, most work involves treatment of new or previously cut vegetation. The use of herbicides would further preclude

these habitat elements from developing in ROWs. Ongoing maintenance precludes habitat from developing, which represents an adverse effect to critical habitat. However, the 2,190.05 acres of affected critical habitat represents 0.08% of the total Mexican spotted owl critical habitat (2,453,465 acres) found across the Forest Service-administered lands considered in this consultation. Despite the overall loss of overstory species diversity, we also anticipate that understory plant richness will likely increase in the canopy gaps created through hazard tree removal, which could lead to beneficial effects for prey habitat.

Shade canopy covering 40% or more of the ground

We expect that shade canopy in Mexican spotted owl critical habitat may be reduced in small patches following hazard tree removal and routine vegetation maintenance along the ROW corridors. It is possible that routine vegetation maintenance will reduce shade canopy below 40% in some areas, especially along transmission line corridors, which are typically maintained as wide and open. We would expect that some small openings may actually aid in increasing the understory herbaceous and forb production along utility corridors and in adjacent habitat, which may benefit prey species.

Large dead trees (snags) with dbh of at least 12 inches

Vegetation removal is likely to include large snags that are greater than 12 inches dbh within Mexican spotted owl critical habitat. Because the ROWs have been continuously maintained, these snags would most likely be removed outside of the ROW as hazard trees. Although hazard trees are generally dispersed over a broad area, snag removal may have a small but potentially adverse effect on this PCE of Mexican spotted owl critical habitat.

Maintenance of adequate prey species

Fallen trees and woody debris, important habitat components for spotted owl prey species, are likely to increase within ROWs from vegetation disposal operations. During disposal, limbs are scattered and large logs and snags (>12 inches dbh) would be left whole at the edge of ROWs when possible. Wood chips could be scattered within ROWs. These disposal methods could benefit some owl prey habitat. However, the range of plant species within ROWs would be altered, particularly in wide transmission ROWs. As ROWs are continually maintained through the removal of vegetation and herbicide application, an understory of early-successional herbaceous and low growing shrub plant cover is expected to develop and herbaceous and shrub plant diversity may increase, thereby providing spotted owl prey habitat. This would not be the case where poles are maintained for DSAP within critical habitat, which would remove all vegetation within 10 feet of distribution poles with equipment that could spark. There are approximately 261 DSAP treatment poles within critical habitat on NFS lands with a total of 1.88 acres of treatment area. Because this is such a small amount of critical habitat where this PCE may be affected, we think the effects to the PCE will be insignificant.

Clumps of trees and woody debris

Continual maintenance of power line ROWs precludes the development of clumps or stringers of mixed conifer, pine-oak, and pinyon-juniper within Mexican spotted owl critical habitat. Riparian vegetation may also be removed and treated with herbicide, although some riparian

areas are not affected because lines are high above vegetation. Thus, management of vegetation would result in some effects to clumps of trees but may also result in a slight beneficial effect through an increase in the percentage of ground litter and woody debris in the ROWs.

Adequate levels of residual plant cover to maintain fruits and seeds, and allow plant regeneration
As more trees are removed from the utility corridors and the canopy is opened, there will likely be increased herbaceous plant growth within the corridor. The mosaic effect created by opening up patches of forest within protected and recovery habitat is also expected to increase herbaceous plant species diversity and, in turn, an increase in prey habitat. The function and conservation role of this PCE will not be adversely affected by the proposed action.

In summary, there are PCEs of Mexican spotted owl critical habitat will be adversely affected by the proposed action. Snags, large trees, and hardwoods will continue to be prevented from establishing and some additional vegetation will be removed during hazard tree removal and routine vegetation maintenance. The habitat alterations discussed here may affect up to 2,190 acres of critical habitat, which represents 0.08% of the total designated critical habitat (2,453,465 acres) on Forest Service-administered lands considered in this consultation.

Narrow-headed and northern Mexican gartersnakes

While there are differences in narrow-headed and northern Mexican gartersnake locations, habitat, and behavior, the proposed action and effects are similar for both gartersnakes. Therefore, in order to reduce replication in language, we are combining these two species in our analysis and making distinctions between the two where appropriate.

Overview
Overall, there are about 166.88 acres of potential narrow-headed gartersnake habitat (and proposed critical habitat) within the project area. Hazard vegetation removal, vegetation maintenance, pole protection, line maintenance and repair, and vegetation disposal may occur within about 155.45 acres of this habitat. Presently, 89.56 of those 155.45 acres have the potential for hazard vegetation treatments. Within narrow-headed gartersnake habitat, defensible space treatment will occur at 56 poles totaling 0.4 acre of upland habitat. In addition, up to 313 poles and 1.57 miles of underground line may be replaced within habitat as well.

For the northern Mexican gartersnake, there are 116.79 acres of potential habitat (and proposed critical habitat) within the project area. Hazard vegetation removal, vegetation maintenance, pole protection, line maintenance and repair, and vegetation disposal may occur within 102.23 acres. Presently, 31.05 acres of habitat have the potential for hazard vegetation treatments. A total of 16 poles consisting of 0.11 acre of upland northern Mexican gartersnake habitat will receive DSAP treatment. Also, up to 169 poles and 2.3 miles of underground line may be replaced in northern Mexican gartersnake habitat.

We anticipate adverse effects to both gartersnakes and proposed critical habitat from continuing removal of vegetation to maintain safe ROWs, to create defensible space around poles, and from holes and trenches created from replacing wood poles and underground lines. We anticipate the

proposed conservation measures will help to reduce adverse effects to both gartersnakes for much of the proposed action. However, because of the overall goal of the project and the necessary methods, adverse effects cannot be avoided and are reasonably certain to occur.

Direct effects
We do not anticipate any direct effects to narrow-headed or northern Mexican gartersnakes from aerial inspection or LiDAR flights. There will be no landing of helicopters in gartersnake habitat and aerial inspection fly-overs will have no contact with or effect to gartersnakes.

Minimizing ground inspection vehicle access to undisturbed narrow-headed and northern Mexican gartersnake habitat is expected to reduce the likelihood of direct effects to gartersnakes such as trampling, injury, or death. Vehicles will primarily stay on established roads within gartersnake habitat (riparian or upland). However, vehicles will infrequently drive off-road or on two-track dirt roads within suitable upland gartersnake habitat. Staying at lower speeds may help drivers detect and avoid snakes or provide snakes the opportunity to evade vehicles, but we anticipate there is a low likelihood of detecting or identifying these dark-colored, small snakes while driving. Northern Mexican gartersnakes may be more vulnerable in upland areas compared to narrow-headed gartersnakes (USFWS 2014c). Because of the gartersnakes' presumed low population densities in most areas, the avoidance of driving off-road in areas most likely to contain either species, the infrequent need to travel off-road in upland habitat, and small number of inspections (1 to 2 per year), we expect the likelihood of running over narrow-headed and northern Mexican gartersnakes with an inspection vehicle is so low as to be discountable. We also expect that any foot inspections that occur outside of vehicles will not result in any direct effects because of the brief 1 to 2 visits per year, the secretive nature and reduced abundance and distribution of the gartersnakes, and the unlikely scenario of workers trampling a gartersnake.

We anticipate there may be some short-term disturbance to narrow-headed and northern Mexican gartersnakes from routine and hazard maintenance and disposal, as well as from DSAP treatments (e.g., vehicles, workers, cutting activities) in gartersnake habitat. Within the habitat of both species, crews using chainsaws or hand tools, especially while gartersnakes are more active during the spring and summer, could cause snakes to quickly move to the nearest water, hole, burrow, crevice, or similar hiding place, likely preventing any direct effects from vegetation cutting. We note that the current environmental baseline of these work areas has already been affected from previous treatments. Therefore, these areas are currently altered and comprised mostly of smaller trees and shrubs. We anticipate that because of the short duration of activities in each work area (approximately one day), any alteration of a snake's behavior will be of short duration. Work crew vehicles will stay on existing roads, drive slowly, and pay attention to avoid snakes. Because gartersnakes are often subsurface, or reside under cover and move quickly to hide, even trained biologists experience low detection rates. We anticipate gartersnake behavior may be altered from routine and hazard vegetation treatments. However, we expect that the effect from vegetation cutting activities (vehicles, workers, cutting) will be insignificant because of the low abundance of both species, use of vegetated areas, ability to move to hiding areas, workers' use of hand tools, and the short duration of activities in each work area.

We also expect that hazard, routine, and DSAP treatments (vehicles, workers, cutting activities) will not likely adversely affect narrow-headed and northern Mexican gartersnakes in upland habitats in the fall and spring when gartersnakes may be less active. If brumating or dispersing gartersnakes are present during upland habitat vegetation management activities, we expect snakes will quickly seek subsurface refugia. The work conducted in upland habitat will occur on foot with no large machinery and will not remove any downed logs, boulders, or other gartersnake hiding areas. Because of their desire to flee, gartersnakes would not likely be present in the vegetation being cut, opting instead to seek cover in subsurface retreats. We therefore anticipate the effects to narrow-headed and northern Mexican gartersnake behavior during routine upland vegetation maintenance, hazard vegetation work, and DSAP treatments will be insignificant.

We do not expect that herbicide applications in gartersnake habitat will directly affect narrow-headed or northern Mexican gartersnakes. Trucks and ATVs would not be used in riparian habitat. Truck use in upland habitat would remain on existing roads and ATV use in upland habitat would predominantly be conducted on existing roads. If driving off-road within ROWs is necessary, then conservation measures that reduce driving speed and require operators to watch for snakes would minimize the potential of running over a snake. Herbicide treatments will be of low-toxicity, manually applied to individual plants (with drip and drift controls), and will occur when precipitation is low and with appropriate toxicity buffers. Herbicides that are slightly, moderately, or highly toxic to gartersnakes will not be used in occupied gartersnake habitat or proposed critical habitat. Only herbicides that are practically non-toxic will be applied within gartersnake proposed critical habitat and occupied habitat, which include: aminocyclopyrachlor, aminopyralid, 2, 4-D (aquatic and nonaquatic ester formulations), fluroxypyr, glyphosate (aquatic formulation), imazapic, imazapyr (aquatic and nonaquatic formulations), picloram, sulfometuron methyl, tebuthiuron, and triclopyr (ester formulation). Direct spray of gartersnakes is unlikely to occur, as the snakes would attempt to escape herbicide applicators and equipment and seek cover. Furthermore, herbicide treatments consist of targeted spot treatments to individual plants or grouping of plants (no broadcast application of herbicide is proposed). Because of the limits placed on toxicity and herbicide use and the manual application of individual trees with drip-drift controls and the small acreage requiring treatment, we expect that the effects to narrow-headed and northern Mexican gartersnakes from selective treatment of riparian and upland trees are discountable.

We anticipate that any maintenance or repair of ROW access roads will have an insignificant effect on narrow-headed and northern Mexican gartersnakes. Many power lines have existing roads that approach and follow along or within the ROW. Road maintenance may occur to facilitate access to power line ROWs, provide safe access, or to repair damage caused by access to the ROWs. Repair activities would likely occur within or near power line ROWs or on established routes or access points, but would occur very infrequently within riparian gartersnake habitat. Because gartersnakes prefer more complex vegetation and do not rely on roads, and also because road maintenance would be infrequent, we do not expect that road repair activities will directly come into contact with and affect individual snakes. It is possible that during the implementation of these tasks work crews could disturb a nearby gartersnake, but we would expect these instances to be rare and result in only a short-term behavior alteration. Therefore,

we anticipate road maintenance activities will be an insignificant and discountable effect to both gartersnake species.

Maintenance of overhead and underground power lines includes inspections and patrols to identify problem areas along the lines, structures, and hardware, and the repair and replacement of these problem areas for overhead and underground transmission and distribution lines. Above ground operations such as repairing equipment on poles or towers, splicing power line, and replacing cross-arms are generally conducted from a line truck parked at the pole, tower or splice location, or by climbing the structure. Ground disturbing activities include digging to install a new power pole or trenching to repair or replace underground power lines. Old poles are not dug up and removed, but simply cut down at base near ground level.

There is uncertainty about exactly how many poles and how much underground line requires replacement within gartersnake habitat. Pole replacement occurs approximately every 30 to 60 years, whereas underground lines typically have a 30-year lifespan. A total of 469 poles and 2.35 miles of underground line occur in narrow-headed gartersnake habitat, and 253 poles and 3.5 miles of underground line occur within northern Mexican gartersnake habitat. Based on the abundance and general longevity of wood poles and underground line, APS estimates that about 313 poles and 1.57 miles of underground power line could be replaced in narrow-headed gartersnake habitat and 169 poles and 2.3 miles of underground line replaced in northern Mexican gartersnake habitat during the 20-year period of this consultation.

Narrow-headed gartersnake populations are considered extant along the East Verde and Verde rivers, and Haigler, Houston, Tonto, Oak, and West Fork Oak creeks, and northern Mexican gartersnakes are known to occur along Little Ash, Tonto, Oak, and Spring creeks. Both gartersnake species are cryptic, secretive, difficult to detect, quick to escape (sometimes underwater and underground), and capable of persisting in low or very low population densities that make positive detections extremely difficult in structurally complex habitat. Both gartersnakes also take advantage of underground retreats such as rodent burrows, rock outcrops, and crevices for various purposes. Regardless of whether it is the warmer or cooler time of the year, gartersnakes spend most of their time underground or under cover, and when gartersnakes are frightened or disturbed, they can seek cover in underground hiding spots.

We anticipate that because of the amount of potential ground disturbance associated with replacement pole installation and underground line work, direct adverse effects to gartersnakes are unavoidable and reasonably likely to occur. The timing and location of this work is unpredictable. Much of this ground disturbance will occur with mechanized equipment, such as truck-mounted augers (possible hand-held augers in remote areas) and vehicle-mounted trenchers. Larger mechanized equipment accomplishes earth-moving goals efficiently, but also disturbs large amounts of earth quickly with greater force and impact, which is more likely to injure or kill subsurface gartersnakes. Implementing conservation measures, including monitoring of ground disturbing activities, may reduce injury or fatality to some snakes. Trenches and holes will not stay open for an extended period of time (a few days), but could potentially attract and trap gartersnakes during work and backfilling, which could result injury or death of gartersnakes from exposure or burial. Because gartersnakes can occupy areas where ground-disturbing work will occur, spend most of their time underground or undercover, and the

abundance and unpredictability of where and when holes and trenches will be dug mechanically, we anticipate that direct effects to gartersnakes (death and injury) from these earth-moving activities are reasonably likely to occur.

We do not expect direct effects to gartersnakes associated with above ground equipment repair of poles or towers, splicing power line, or replacing cross-arms. These activities occur from a parked truck at a pole, tower, or splice location, or by climbing the structure. Vehicle travel to and from repair locations will primarily stay on roads at slow speeds and will rarely go off-road, limiting the possibility of injury or death to snakes. Work to repair lines, poles, and other above-ground structures will typically occur from a truck and on the pole itself. Therefore, these repair activities are unlikely to result in interactions with ground dwelling gartersnakes. Vehicle movement on roads and parking at work sites could result in a rare, but temporary disturbance to a nearby gartersnake. As a result, we anticipate that any effects to gartersnake habitat from vehicles or alteration of their behavior from above ground equipment repair of poles and towers will have an insignificant effect to both gartersnake species.

Indirect effects

We do not anticipate indirect effects to individual gartersnakes from inspection and LiDAR helicopters because of the short duration, infrequent occurrence, and high distance off the ground associated with these activities. Vehicles will stay on existing roads within riparian areas and whenever possible in upland areas. No new roads will be established under the proposed action. As a result of primarily staying on existing roads, the infrequent need to travel off-road in upland areas, and the limited number of inspections per year (1 to 2), we also anticipate any indirect effects to narrow-headed and northern Mexican gartersnakes and their habitat from ground inspection vehicles will be insignificant. Similarly, foot inspections that occur outside of vehicles are not expected to result in any direct or indirect effects to gartersnakes because of the brief 1-2 visits per year, the secretive nature and reduced abundance and distribution of the gartersnakes, and the unlikely scenario of workers trampling a gartersnake or noticeably altering any vegetation that gartersnakes rely upon.

Routine maintenance, hazard vegetation, and pole protection treatments are expected to affect both gartersnakes' habitat and their recovery by maintaining cleared areas within portions of approximately 155.45 acres of narrow-headed and 102.23 acres of northern Mexican gartersnake habitat. Within these acres, hazard vegetation cutting activities may occur within 89.56 acres of narrow-headed and 31.05 acres of northern Mexican gartersnake habitat, as well as continued vegetation maintenance. A total of 56 poles (0.40 acre) and 16 poles (0.11 acre) may receive DSAP treatments in narrow-headed and Mexican northern gartersnake habitat, respectively. Gartersnakes rely on complex vegetated areas to bask, hunt, hide, and shelter. For example, narrow-headed gartersnake presence often correlates with streamside willows used as basking sites and their contribution to downed vegetation and organic debris. However, the plant species and canopy structure may be less important than the tree's size (USFWS 2013c, 2014c). Northern Mexican gartersnakes rely on complex vegetation to support its prey populations and the means to hunt, hide, thermoregulate, and seek protection from predators. Tree removal, vegetation maintenance, and clearing reduces the overall habitat complexity and canopy structure important for gartersnakes to hide, shelter, thermoregulate, gestate, forage, and support prey populations (USFWS 2013c). However, reduced ground vegetation and canopy structure may

also improve basking opportunities for gartersnakes, and in particular for gestating females seeking prolonged, elevated body temperatures. Reduced structural diversity in upland areas from these treatments will also simplify and reduce shelter and hiding areas. Because these areas have already been affected from past vegetation clearing activities and are spread across 10 different streams and over 39 different sites, we do not anticipate these actions will noticeably affect existing snake territories or brumation sites. However, the proposed action will continue to maintain these areas in a relatively cleared state, preventing more complex and important gartersnake habitat from developing. As a result, we find that the continued removal of vegetation for hazard, vegetation maintenance, and defensible pole space purposes will adversely affect gartersnakes within these areas.

We anticipate that downed material resulting from vegetation removal could provide some short-term benefits to narrow-headed and northern Mexican gartersnakes in the form of structural enhancements to habitat. Slash vegetation will primarily be lopped and scattered in the immediate area. Occasionally, at the request of the Forest Service and only where road access allows, vegetation may be chipped and broadcast in the immediate area. While the proposed immediate chipping of downed material is not expected to generate benefits, scattering cut vegetation could provide additional gartersnake cover. No slash piles are planned for removal. Because of periodic flooding and deterioration of leaf litter and other organic debris, we expect any beneficial effects from scattering vegetation will likely be short-term in nature.

We anticipate that any indirect effects to narrow-headed and northern Mexican gartersnakes from herbicide applications will be insignificant. Herbicide applications consist of targeted spot treatments to individual plants or grouping of plants (no broadcast application of herbicide is proposed). The quantity of vegetation treated within ROWs would be low with grasses, forbs, and many lower growing shrubs remaining untreated and shrubs treated when the density is high enough to create a fire hazard. Narrow-headed and northern Mexican gartersnakes do not rely on contiguous stands of dense mature riparian vegetation and understory, but rather complex mosaics of vegetation including diversity in debris and structures for cover, movements, and foraging. The proposed action is not expected to alter the structural diversity of grasses, boulders, debris, logs, or the function of streams. Given the application methods, conservation buffers, and low toxicity of herbicides used, it is unlikely that gartersnake prey populations would be affected by herbicide applications. Because of the alteration of a small amount of vegetation in a normally patchy and dynamic habitat conditions, we expect any indirect effects to gartersnakes will be insignificant.

We anticipate that any maintenance or repair of ROW access roads will have an insignificant effect on narrow-headed and northern Mexican gartersnake habitat or prey species. Because these roads are already established, we anticipate minor and infrequent site-specific maintenance that is not expected to impede the development of new gartersnake habitat or alter existing habitat or prey species.

We do not expect indirect effects to gartersnakes associated with above ground equipment repair of poles or towers, splicing power line, or replacing cross-arms. These activities occur from a parked truck at a pole, tower, or splice location, or through climbing the structure. Vehicle travel to and from repair locations will primarily stay on roads at slow speeds and will rarely go off-

road, causing only minor, localized, and temporary effects to herbaceous vegetation. Work to repair lines, poles, and other above-ground structures will typically occur from a truck and on the pole itself. Therefore, no ground disturbing actions from the repair activity are likely to occur and no interaction with ground dwelling gartersnakes. As a result, we anticipate that any effect to gartersnakes and its habitat from vehicles will be insignificant.

Any potential direct or indirect adverse effects to gartersnake prey species because of this project's implementation are expected to be insignificant or discountable (see Appendix A).

Proposed critical habitat
We anticipate the effect to the proposed PCEs of narrow-headed and northern Mexican gartersnake critical habitat from vehicle inspections will be insignificant. Vehicles will primarily stay on existing established paved roads, dirt roads, and two track roads. No new roads will be established. Vehicles will never drive off-road within riparian areas. Vehicles may infrequently need to drive off-road in upland gartersnake proposed critical habitat, but the short-term and infrequent need to travel in these undisturbed areas (1 to 2 visits per year) is not expected to noticeably alter any lateral space (PCE 2) and will not affect any stream function, streamside vegetation, or prey base (PCE 1, 3, and 4).

Aerial inspections would have no effect on the proposed PCEs of narrow-headed and northern Mexican gartersnake critical habitat, and any effect to PCEs from foot traffic is expected to be insignificant. Aerial inspection will never touch the ground and therefore will not affect stream function, vegetation, or prey. Worker foot traffic may mildly disrupt herbaceous vegetation, but will not affect any stream, stream function, prey, space, or vegetation relied upon by gartersnakes.

The proposed hazard, maintenance, and pole vegetation removal activities are expected to have adverse effects to narrow-headed and northern Mexican gartersnake proposed critical habitat PCEs related to riparian vegetation (PCE 1) and habitat structural diversity (PCE 2) within approximately 164 (narrow-headed) and 102 (northern Mexican) acres of proposed critical habitat. The continued maintenance of ROW corridors and removal of hazard vegetation will adversely affect PCE 1 by continuing to prevent the development of riparian habitat with adequate organic and inorganic structural complexity. Additionally, continued vegetation removal in more upland areas is expected to adversely affect the vegetated structural characteristics (PCE 2).

We expect that hazard, vegetation, and pole maintenance will have an insignificant effect to narrow-headed and northern Mexican gartersnake proposed critical habitat PCEs associated with river function and prey. Vegetation removal spread across 10 different streams and over 39 different sites is expected to result in an insignificant effect on the function of streams (river flow), rivers, springs, and cienegas (PCE 1a, b, and d). Because no work will occur within streams and because the habitat-removal projects are spread across many sites (therefore no single area is cleared of many acres), maintaining cleared areas is expected to have an insignificant effect on gartersnake prey quality, quantity, or species composition (PCE 3 and 4).

We anticipate the proposed action would have a short-term increase in the quantity of downed trees and logs following vegetation removal and disposal. Spreading cut vegetation may provide a short-term benefit, supporting narrow-headed and northern Mexican gartersnake gestation, brumation, dispersal, shelter, hiding, and foraging. However, because the dynamic nature of rivers, we expect these features will deteriorate/disappear due to annual flood events.

Herbicide treatments may occur across 39.94 acres of narrow-headed gartersnake proposed critical habitat and 26.46 acres of northern Mexican proposed critical habitat, representing 0.36% and 0.3%, respectively, of riparian vegetation contained in proposed critical habitat across the project area. Effects of herbicide treatments are limited to the narrow ROW corridors, which have been maintained in the past and currently contain lower quantities of vegetation than adjacent habitat. Furthermore, because herbicide applications consist of targeted spot treatments to individual plants or grouping of plants, the actual quantity of vegetation treated over the ROW area would be low with grasses, forbs, and many lower growing shrubs remaining untreated. Narrow-headed and northern Mexican gartersnakes do not rely on contiguous stands of dense mature riparian vegetation and understory, but rather complex mosaics of vegetation including diversity in debris and structures for cover, movements, and foraging. Herbicide applications would not result in any effect to streams, rivers, springs, livestock tanks, cienegas, channel or off-channel pools, or backwater habitat flow or flooding regimes. Given the application methods and proposed conservation measures, it is unlikely that herbicides will drift or run off into the water. Although some minor changes in organic composition may occur from the removal of individual plants, we anticipate that the effects to riparian and terrestrial components of gartersnake proposed critical habitat (PCE 1 and 2) will be insignificant.

Given the application methods, conservation measures (including aquatic buffers), and low toxicity of herbicides used, we anticipate that effects to prey populations of both gartersnake species (PCE 3) will be insignificant. We also expect that herbicide applications will have no effect on crayfish populations or the relative composition or abundance of native versus non-native fish species (PCE 4).

We anticipate the maintenance of existing access routes will have an insignificant effect to PCEs for narrow-headed and northern Mexican gartersnake proposed critical habitat. Because no new roads will be developed and the maintenance of existing roads is expected to be site specific, infrequent, and mostly in upland areas, we anticipate that any indirect effects to streams or habitat (PCE 1), from such factors as sedimentation, will be insignificant. Also, because of the site-specific nature of road maintenance, its infrequent occurrence, and the lack of relied upon habitat occurring along roads, we do not expect any effect to terrestrial space (PCE 2), aquatic or upland prey habitat or populations (PCE 3), or prey species composition (PCE 4).

We anticipate the digging of holes and trenches will have an adverse effect to PCE 2 of proposed gartersnake critical habitat. Trenching within narrow-headed and northern Mexican gartersnake proposed critical habitat will temporarily alter terrestrial space adjacent to streams supporting gartersnake gestation, migration, and brumation (PCE 2). The earth moving activities will temporarily move above ground rocks, boulders, and other organic and inorganic materials gartersnakes take advantage of and remove vegetation and earth while digging and trenching. We expect that this habitat alteration will be temporary because trenches will be filled and

afterwards allowed to recover. We do not anticipate that trenching and hole digging will occur within riparian areas adjacent to streams. Because trenching and hole digging is expected to occur in the uplands and dispersed throughout proposed critical habitat, we do not anticipate any effect to stream function (PCE 1), prey populations (PCE 3), or prey species composition (PCE 4).

We expect above ground line maintenance work will not affect any of the PCEs of proposed gartersnake critical habitat. Repair work will occur above the ground on poles and lines preventing any effect to streams, space, or prey populations. Vehicles will primarily stay on roads and may only periodically go off-road to access some poles or underground line. As a result, of vehicles staying on roads with the infrequent need to travel off-road in undisturbed areas, we anticipate repair vehicles will not noticeably alter any lateral space (PCE 2) and will not affect any stream function, streamside vegetation, or prey base (PCE 1, 3, and 4).

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.

Southwestern willow flycatcher

Non-federal activities that are reasonably certain to occur, which could affect southwestern willow flycatchers in the action area include: power line maintenance actions on non-federal lands; road and bridge projects; various forms of recreation; land clearing and development; groundwater pumping; agricultural land uses and runoff; water diversions; livestock grazing; and climate change. These activities may contribute as cumulative effects to the proposed action and further disturb breeding flycatchers as well as reduce the quality and quantity of flycatcher habitat, including those physical and biological features and primary constituent elements of critical habitat associated with riparian habitat and its establishment and growth.

Western yellow-billed cuckoo

Non-federal activities that are reasonably certain to occur, which could affect western yellow-billed cuckoos in the action area include: power line maintenance actions on non-federal lands; road and bridge projects; various forms of recreation; land clearing and development; groundwater pumping; agricultural land uses and runoff; water diversions; livestock grazing; and climate change. These activities may contribute as cumulative effects to the proposed action and further disturb breeding cuckoos as well as reduce the quality and quantity of cuckoo habitat, including those physical and biological features and primary constituent elements of critical habitat associated with riparian habitat and its establishment and growth.

Mexican spotted owl

Future non-Federal activities within the action area that are reasonably certain to occur include the modification of habitat and disturbance from actions occurring on adjacent ownerships and inholdings (e.g., road construction, land clearing, logging, fuelwood gathering, recreation).

These activities may reduce the quality and quantity of Mexican spotted owl nesting, roosting, and foraging habitat; result in disturbance to breeding owls; and contribute as cumulative effects to the proposed action. However, because Federal lands support most of known Mexican spotted owl sites, and because of the role of the respective Federal agencies in administering Mexican spotted owl habitat, actions implemented in the future by non-Federal entities on non-Federal lands are considered to be minor to the overall owl population, but may have significant effects to individual Mexican spotted owls and habitat.

Narrow-headed and northern Mexican gartersnakes

Future non-Federal activities within the action area that are reasonably certain to occur include the modification of gartersnake habitat and disturbance from actions occurring on adjacent State, private, tribal and other non-federal ownerships and inholdings (e.g., road construction, land clearing, water use, land management, recreation). As a result, some residential and potential commercial development, road construction, farming, livestock grazing, off-highway vehicle use, recreation, and other activities occur on these lands and are expected to continue into the foreseeable future. Non-federal actions on these lands could contribute collectively or individually to the introduction or movement of non-native species, dewatering of streams, and degradation to riparian habitat and uplands that effect gartersnakes and their habitat on adjacent Federal lands. Improperly managed livestock operations off public lands could degrade narrow-headed and northern Mexican gartersnake habitat. Recreation, off-road vehicle use, and human-caused wildfire originating off public lands could spread onto NFS lands and affect gartersnakes. These activities may reduce the quality and quantity of gartersnake habitat, with a pronounced effect when overlapping with areas harboring harmful non-native species; resulting in disturbance to gartersnakes, and contributing as cumulative effects to the proposed action.

ANALYTICAL FRAMEWORK FOR THE JEOPARDY AND ADVERSE MODIFICATION DETERMINATIONS

Jeopardy Determination

In accordance with policy and regulation, the jeopardy analysis in this BO relies on four components: (1) the *Status of the Species*, which evaluates range-wide condition of the southwestern willow flycatcher, yellow-billed cuckoo, Mexican spotted owl, narrow-headed gartersnake, and northern Mexican gartersnake, the factors responsible for that condition, and the species' survival and recovery needs; (2) the *Environmental Baseline*, which evaluates the condition of the above species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of these species; (3) the *Effects of the Action*, which determines the direct and indirect effects of the proposed Federal action and any interrelated or interdependent activities on these species; and, (4) *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on these species.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the species' current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of these

species in the wild. The jeopardy analysis in this BO considers the range-wide survival and recovery needs of these species and the role of the action area in their survival and recovery as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the jeopardy determination.

Adverse Modification Determination

This BO relies on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02[1]. In accordance with policy and regulation, the adverse modification analysis in this BO relies on four components: 1) the *Status of Critical Habitat*, which evaluates the range-wide condition of designated critical habitat for the southwestern willow flycatcher, yellow-billed cuckoo, Mexican spotted owl, narrow-headed gartersnake, and northern Mexican gartersnake in terms of physical and biological features[2], the factors responsible for that condition, and the intended value of the critical habitat for survival and recovery of the species; 2) the *Environmental Baseline*, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the value of the critical habitat for survival and recovery of the species in the action area; 3) the *Effects of the Action*, which determines the direct and indirect effects of the proposed Federal action and the effects of any interrelated or interdependent activities on the physical and biological features and how that will influence the value of affected critical habitat units for survival and recovery of the species; and, 4) the *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the physical and biological features and how that will influence the value of affected critical habitat units for survival and recovery of the species.

For purposes of the adverse modification determination, the effects of the proposed Federal action on the species' critical habitat are evaluated in the context of the range-wide condition of the critical habitat, taking into account any cumulative effects, to determine if the critical habitat range-wide would remain functional (or would not preclude or significantly delay the current ability for the physical and biological features to be functionally established in areas of currently unsuitable but capable habitat) such that the value of critical habitat for the conservation of the species is not appreciably diminished.

CONCLUSION

After reviewing the current status of the southwestern willow flycatcher, yellow-billed cuckoo, Mexican spotted owl, narrow-headed gartersnake, and northern Mexican gartersnake, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects, it is our biological opinion that the action, as proposed, is not likely to jeopardize the

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[1] See 81 FR 7214.

[2] The term "primary constituent elements" was introduced in critical habitat designation regulations (50 CFR 424.12) to describe aspects of "physical or biological features," which are referenced in the statutory definition of critical habitat. The Services have removed the term "primary constituent elements" and returned to using the statutory term "physical or biological features" (81 FR 7414). Existing critical habitat designations will not be republished to reflect this change; however, in future rules we will discontinue using the term "primary constituent elements" and instead will use "physical and biological features".

continued existence of the flycatcher, cuckoo, Mexican spotted owl, narrow-headed or northern Mexican gartersnakes, and is not likely to destroy or adversely modify designated critical habitat for the flycatcher and Mexican spotted owl, or proposed critical habitat for the yellow-billed cuckoo, narrow-headed gartersnake, or northern Mexican gartersnake. We base this conclusion on the following:

Southwestern willow flycatcher

- Conservation measures associated with the timing of activities, vegetation treatment, and herbicidal control will limit the effects to targeted plants within the ROW, and minimize disturbance and effects to individual flycatchers and their food sources.

- Of the 12.85 acres of designated critical habitat within the project area, vegetation removal and suppression are likely to occur within a smaller area of critical habitat (6.57 acres), of which 5.09 acres is riparian vegetation. Overall, the 12.85 acres of critical habitat adversely affected by the proposed action is a small fraction (0.09%) of the critical habitat that exists within the action area.

- The critical habitat to be treated within the action area is anticipated to remain in a degraded state for the length of the proposed action and the foreseeable future for as long as the power lines exist. The overall small area and amount of vegetation to be treated is not anticipated to prevent the Gila Recovery Unit, or Roosevelt and Verde Management Units from functioning for the conservation of the flycatcher or from reaching the habitat and numerical goals established in the Recovery Plan.

Western yellow-billed cuckoo

- Conservation measures associated with the timing of activities, vegetation treatment, and herbicidal control will limit the effects to targeted plants within the ROW, and minimize disturbance and effects to individual cuckoos and their food sources.

- Of the 45.75 acres of proposed critical habitat and 7.88 acres of suitable habitat outside of proposed critical habitat, vegetation removal and suppression are most likely to occur within a smaller area of proposed critical habitat (9.19 acres). Overall, the 45.75 acres of proposed critical habitat adversely affected by the proposed action is a small fraction (0.33%) of the critical habitat that exists within the action area. Because of the small amount of overall vegetation being removed and because the removal is not expected to alter critical habitat function elsewhere for the cuckoo, and we anticipate that proposed critical habitat will continue to function in its conservation role for the cuckoo.

Mexican spotted owl

- Although treatments in critical habitat will adversely affect some PCEs and treatments in protected and restricted habitat will reduce key habitat components, the proposed action will increase the long-term viability of Mexican spotted owl habitat by reducing the threat of a high-severity, stand-replacing wildfire starting along APS ROW corridors on NFS-administered lands.

- The implementation of the proposed action will not impede the survival or recovery of Mexican spotted owls within the action area. The proposed project includes approximately 2,190 acres of critical habitat. Because of the relatively small size of the area in comparison to the 2,453,465 acres of critical habitat designated on NFS-administered lands considered in the consultation, the adverse effects to PCEs will not appreciably reduce the value of critical habitat for the species' conservation, and will not rise to the level of destruction or adverse modification.

- While APS will remove large dbh trees and snags under the proposed action, which may result in short-term disturbance and adversely affect key habitat components and PCEs, it will not preclude use of these areas by Mexican spotted owls or their prey species.

- Conservation measures associated with the timing of activities, vegetation treatment, and herbicidal control will limit the effects to targeted plants within the ROW, and reduce disturbance and effects to individual owls and their prey species.

Narrow-headed and northern Mexican gartersnakes

- Based on the abundance and general longevity of wood poles and underground line, APS estimates that about 313 poles and 1.57 miles of underground power line could be replaced in narrow-headed gartersnake habitat and 169 poles and 2.3 miles of underground line replaced in northern Mexican gartersnake habitat during the 20-year period of this consultation. There is some overlap in critical habitat between the two species. As a result, the number of poles and underground line replaced is likely to be less than the amounts identified above. Trenches and holes will be filled within days of being dug and then will be left to continue to serve their conservation role. Therefore, trenching and hole digging will cause temporary adverse effects to proposed PCEs of critical habitat, but will not destroy or adversely modify proposed gartersnake critical habitat.

- Hazard vegetation removal and vegetation maintenance work will occur within 155.45 acres of proposed narrow-headed gartersnake and 102.23 acres of northern Mexican gartersnake critical habitat (some acreage is shared between these two species). Overall, hazard vegetation work may occur within 89.56 acres of narrow-headed and 31.05 acres of northern Mexican gartersnake critical habitat. These actions will be spread across at least 10 different streams and 35 different sites, dispersing the effect throughout gartersnake occupied habitat and proposed critical habitat. While continuing to maintain cleared areas eliminates the complex habitat preferred by gartersnakes, areas will not be paved or permanently eliminated, but will be comprised of openings (which naturally occur throughout riparian areas). Because these cleared areas will be dispersed across the action area, the adverse effect is minimized, and therefore we do not expect the vegetation removal will affect the overall function of the streams, or affect prey populations or prey species composition.

- The work within 155.45 acres of narrow-headed gartersnake and 102.23 acres of northern Mexican gartersnake proposed critical habitat is a minute fraction of the approximate 620,000 acres proposed as gartersnake critical habitat. Because the amount of overall

vegetation being removed is dispersed across many areas and because the removal is not expected to alter stream function or gartersnake prey species and populations, we anticipate that proposed gartersnake critical habitat will not be destroyed or adversely modified and will continue to function its conservation role.

- We anticipate that the adverse effect to gartersnake recovery by maintaining cleared ROW corridors is minimized because vegetation clearing is dispersed across 10 different streams and at least 35 different sites. As a result, we anticipate these localized and dispersed changes to gartersnake habitat quality will not jeopardize gartersnakes.

- Gartersnakes are secretive, able to persist in low densities, and are dispersed across various streams in the United States within Arizona and Mexico (USFWS 2013c). Because gartersnake populations persist and are dispersed across a broad area, we anticipate the direct effects caused by this project will not jeopardize either species continued existence.

- The implementation of conservation measures and attention paid to gartersnakes should reduce the occurrence of incidental take and may provide new information about gartersnake distribution and abundance.

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

INCIDENTAL TAKE STATEMENT

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

We do not expect incidental take of the southwestern willow flycatcher or the western yellow-billed cuckoo. We do expect that incidental take of the Mexican spotted owl, narrow-headed gartersnake, and northern Mexican gartersnake will occur.

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

AMOUNT OR EXTENT OF TAKE

The Service does not anticipate the proposed action will incidentally take any southwestern willow flycatchers or yellow-billed cuckoos for the following reasons:

- The lack of habitat within ROWs for the southwestern willow flycatcher and yellow-billed cuckoos from previous treatment and maintenance of vegetation is the primary reason why we do not anticipate any incidental take from the proposed action of continuing to remove developing riparian trees.

- Additional conservation measures that limit access and restrict timing of treatments and application of herbicides contribute to reducing effects to these riparian birds and their insect-based diet.

The 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.

Mexican spotted owl

For the purposes of evaluating incidental take of Mexican spotted owls from the action under consultation, incidental take can be anticipated as either the direct fatality or injury of individual birds, or the alteration of habitat that affects behavior (e.g., breeding or foraging) of birds to such a degree that essential behaviors are impaired, and the birds are thus "taken." They may fail to breed, fail to successfully rear young, raise fewer young or young with reduced fitness, or abandon the area because of disturbance or habitat no longer meets the owl's needs.

Current section 7 consultation guidance provides for incidental take if an activity compromises the integrity of a PAC. We generally do not consider actions outside PACs to result in incidental take of owls, except in cases when areas that may support owls have not been adequately surveyed and we are reasonably certain incidental take could occur. Using available information as summarized within this document, we have identified conditions of possible incidental take for the Mexican spotted owl associated with the proposed action within the 16 PACs where power line ROWs transect a portion of the PAC rather than occurring along the edge (Table 11).

Based on the best available information concerning the Mexican spotted owl, habitat needs of the species, the project description, and information furnished by the Forest Service, incidental take is anticipated for the Mexican spotted owl as a result harm and/or harassment from the following actions:

- Vegetation removal actions that modify key habitat components and may result in degraded nesting, roosting, and foraging habitat (except the Mormon Mountain and Strawberry PACs; Table 11). The majority of vegetation treatments would involve the removal of saplings and young trees. However, hardwoods, snags, and large diameter trees may be removed at the edge of or outside ROWs. The Mormon Mountain and Strawberry PACs are transected strictly by underground lines, which typically do not receive vegetation treatments.

- The potential for multiple flights along power line corridors each year during the breeding season over PACs. Low altitude helicopter flights may result in temporary disturbance to owls that could result in flush responses or decreased prey delivery or feeding.

- Ground patrols or inspections during the breeding season in PACs that result in flush responses from nests or roosts.

- Removal and disposal of hazard vegetation during the breeding season within or near PACs, causing disturbance to owls that could result in flush responses or decreased prey delivery and feeding.

- Hazard line maintenance work and repairs (e.g., overhead and underground lines, pole replacements) may occur during the MSO breeding season. The presence of humans and equipment during the breeding season could result in adverse effects including failed reproductive efforts, abandonment of the nest, or starvation. These effects are most likely in the 16 PACs identified in Table 11.

We anticipate that the incidental take of Mexican spotted owls will be difficult to detect because finding a dead or impaired specimen is unlikely. Incidental take can be anticipated by short-term effects from disturbance or permanent habitat modification within PACs that will affect the reproductive success and survival of Mexican spotted owls within the project area. We anticipate harm to Mexican spotted owls from removing key nesting, roosting, and foraging habitat components from vegetation removal activities. We also anticipate harassment to Mexican spotted owl breeding, feeding, and sheltering from disturbance from the combination of effects caused by aerial patrols, ground patrols, and vegetation removal-disposal activities.

We anticipate the incidental take of one pair of Mexican spotted owls (which may include associated eggs or juveniles) in the form of harm or harassment at each of the 16 PACs. Incidental take is anticipated to occur at least once in each PAC over the course of the project from habitat modification and disturbance associated with the combination of aerial and ground patrols, and vegetation removal along utility corridors over the course of this 20-year proposed action. This anticipated take may be short-term disturbance (short-term disturbance is defined as

one to three breeding seasons of non-habitat altering action that disrupts or is likely to disrupt owl behavior), permanent habitat modification along the utility corridors within the PACs, or a combination of disturbance and habitat modification.

Because of 1) the establishment of these PAC, 2) the importance of these areas for spotted owl breeding, feeding, and sheltering, and 3) the current quality of forested habitat within these PACs, the combination of vegetation management and other disturbing activities occurring along those power lines transecting the PACs, are most likely to result in the incidental take of Mexican spotted owls associated with these areas. It is possible that incidental take could occur to owls associated with the other 46 PACs intersected by or within 0.25 mile of APS power lines in the action area. However, because it is difficult to predict where effects from the proposed action may actually occur, it is problematic to anticipate incidental take with any reasonable certainty. Incidental take identified with this action will be confirmed and modified, if necessary, by annual summary reports (Appendix C). Although we have attempted to clearly identify the PACs where incidental take is expected, the scale and temporal components of this project do not allow for a precise accounting of exactly which owls may be taken by the proposed action. However, if annual reports indicate that incidental take may differ from the 16 PACs identified above, we will work with the Forest Service to determine whether we need to modify the list of PACs where incidental take of Mexican spotted owls actually occurred or whether reinitiation is necessary.

Narrow-headed and northern Mexican gartersnakes

Based on the best available information for the narrow-headed and northern Mexican gartersnakes, the habitat needs of this species, the project description, and information provided by the Forest Service and APS, incidental take is considered likely for the narrow-headed and northern Mexican gartersnake from the proposed action. Incidental take of both narrow-headed and northern Mexican gartersnakes is expected in the form of physical injury or death from ground disturbing activities. Because of the limited amount of work and reduced number of known gartersnake populations, we do not anticipate the number of gartersnakes taken will exceed 10 individuals (any combination of the two species) over the 20-year project period. Because of the long-term nature of the proposed action, no more than 5 gartersnakes (any combination of the two species) shall be taken during any 5-year period of the project.

Finding incidentally taken gartersnakes is difficult. Therefore, we will consider that the amount or extent of incidental take of 10 gartersnakes has been reached based on the detection of 7 physically injured or dead gartersnakes (any combination of narrow-headed and northern Mexican gartersnakes) over the 20-year project period. Incidental take identified with this action will be confirmed and modified, if necessary, by annual summary reports (Appendix C).

Furthermore, because gartersnakes are small-bodied, secretive, well-camouflaged, use subsurface retreats and protective cover, and because heavy machinery operations extend underground, gartersnakes may be incidentally taken but not observed. If live gartersnakes are observed during heavy equipment activities (trenching, hole digging, backfilling), there is a greater likelihood of their presence and incidental take. Therefore, to provide an early alert, if a total of 4 individual live narrow-headed or northern Mexican gartersnakes (separately or together) are

observed during ground disturbance activities (disturbance footprint and immediately adjacent action area) over any 5-year period (four separate five-year periods), the Forest Service and/or APS will contact this office as soon as possible to discuss whether consultation reinitiation and/or additional conservation measures are necessary.

EFFECT OF THE TAKE

We have determined that the level of anticipated take described above is not likely to jeopardize the continued existence of the Mexican spotted owl or to result in destruction or adverse modification of its designated critical habitat. We have also determined that the level of anticipated take described above is not likely to jeopardize the continued existence of the narrow-headed or northern Mexican gartersnakes or to result in destruction or adverse modification of their proposed critical habitat.

REASONABLE AND PRUDENT MEASURES

Mexican Spotted Owl

The following reasonable and prudent measure is necessary and appropriate to minimize take of Mexican spotted owl:

1. The Forest Service shall monitor incidental take resulting from the proposed action and report to the Service the findings of that monitoring.

Northern Mexican and Narrow-headed Gartersnakes

The following reasonable and prudent measure is necessary and appropriate to minimize take of northern Mexican and narrow-headed gartersnakes:

1. The Forest Service shall monitor incidental take resulting from the proposed action and report to the Service the findings of that monitoring.

TERMS AND CONDITIONS

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

Mexican Spotted Owl

The following terms and conditions implement reasonable and prudent measure #1 for the Mexican spotted owl:

1.1 The Forest Service shall monitor the action area to ascertain incidental take of Mexican spotted owls or loss of its habitat from harm and harassment. The Forest

Service and APS will conduct this monitoring and reporting using the protocols established in Appendix C.

Northern Mexican and Narrow-headed Gartersnakes

The following terms and conditions implement reasonable and prudent measure #1 for the northern Mexican and narrow-headed gartersnakes:

1.1 The Forest Service shall monitor the action area to ascertain incidental take of northern Mexican and narrow-headed gartersnakes from injury and death. The Forest Service and APS will conduct this monitoring and reporting using the protocols established in Appendix C.

The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the effect of incidental take that might otherwise result from the proposed action. We believe all appropriate measures to reduce and minimize incidental take are identified in the proposed action. Therefore, these measures focus solely on the monitoring and reporting of effects associated with incidental take. If, during the course of the action, the level of incidental take is exceeded, such incidental take would represent new information requiring review of the reasonable and prudent measures. The Forest Service must immediately provide an explanation of the causes of the taking and review with the AESO the need for possible modification of the reasonable and prudent measures and consultation reinitiation.

Disposition of Dead or Injured Listed Species

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

CONSERVATION RECOMMENDATIONS

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

Southwestern willow flycatcher

1. We recommend that the Forest Service and APS continue to monitor changing habitat conditions, rules and regulations, and the status of the flycatcher and fund or conduct protocol surveys in appropriate areas within the action area to determine the presence and status of flycatchers, especially in areas adjacent to ROWs.

2. We recommend the Forest Service and APS implement conservation strategies and recovery actions identified in the Recovery Plan to improve the distribution and abundance of breeding southwestern willow flycatchers.

Western yellow-billed cuckoo

1. We recommend that the Forest Service and APS continue to monitor changing habitat conditions, rules and regulations, and status of the cuckoo and fund or conduct protocol surveys in appropriate areas within the action area to determine the presence and status of yellow-billed cuckoos, especially in areas adjacent to ROWs.

2. We recommend that the Forest Service and APS continue to cooperate with the Service and other partners to conduct research to understand vital yellow-billed cuckoo habitat requirements, response to changing habitat conditions, home range, foraging strategies, and other important life history information that would contribute to the management and recovery of their habitat and analysis of potential effects from proposed projects.

Mexican spotted owl

1. We recommend that the Forest Service work with us to determine if we need to add acres to PACs bisected by power line corridors.

2. We recommend that the Forest Service continue to work with us to reduce the effects of utility corridor management on Mexican spotted owls and their habitats.

3. We recommend that the Forest Service conduct surveys for the next 10 years in all PACs affected by utility corridors in order to determine nest core areas and potential effects of vegetation management in the utility corridors.

4. We recommend that the Forest Service work with us to plan and implement actions to improve and create Mexican spotted owl nest/roost replacement habitat across the National Forests in Region 3.

Narrow-headed gartersnake and northern Mexican gartersnake

1. We recommend the Forest Service work with us to implement recovery actions as described within the narrow-headed gartersnake and northern Mexican gartersnake recovery plans when they are completed.

2. We recommend the Forest Service work with the Arizona Game and Fish Department (AGFD) and us to not only prevent the introduction or movement of non-native aquatic

species, but also implement a removal program for non-native aquatic species over the long term that reduces the distribution and density of harmful non-native species on NFS lands to facilitate recovery of gartersnakes.

3. We recommend the Forest Service work with AGFD and Service to conduct surveys to determine the distribution, abundance, and trends of narrow-headed and northern Mexican gartersnakes on NFS lands.

4. We recommend the Forest Service maintain active relationships with the gartersnake community by ensuring forest biologists and other appropriate staff attend relevant meetings and coordinate in monitoring and recovery planning.

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

REINITIATION NOTICE

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.

This also concludes the conference on the actions outlined in the request. You may ask us to confirm the conference opinion as a biological opinion issued through formal consultation if proposed critical habitat is designated. The request must be in writing. If we review the proposed action and find there have been no significant changes in the action as planned or in the information used during the conference, we 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 Forest Service 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 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.

Certain project activities may also affect species protected under the Migratory Bird Treaty Act (MBTA) of 1918, as amended (16 U.S.C. sec. 703-712) and/or bald and golden eagles protected

under the Bald and Golden Eagle Protection Act (Eagle Act). The MBTA prohibits the intentional taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when authorized by the Service. The Eagle Act prohibits anyone, without a Service permit, from taking (including disturbing) eagles, and including their parts, nests, or eggs. If you think migratory birds and/or eagles will be affected by this project, we recommend seeking our Technical Assistance to identify available conservation measures that you may be able to incorporate into your project.

For more information regarding the MBTA and Eagle Act, please visit the following websites. More information on the MBTA and available permits can be retrieved from FWS Migratory Bird Program web page and FWS Permits Application Forms. For information on protections for bald eagles, please refer to the Service's National Bald Eagle Management Guidelines (72 FR 31156) and regulatory definition of the term "disturb" (72 FR 31132) published in the Federal Register on June 5, 2007, as well at the Conservation Assessment and Strategy for the Bald Eagle in Arizona (Southwestern Bald Eagle Management Committee website).

In keeping with our trust responsibilities to American Indian Tribes, we encourage you to continue to coordinate with the Bureau of Indian Affairs in the implementation of this consultation and, by copy of this biological opinion, are notifying affected Tribes of its completion. We also encourage you to coordinate the review of this project with the AGFD.

We appreciate the Forest Service's efforts to identify and minimize effects to listed species from this project. Please refer to the consultation number, 02EAAZ00-2018-F-0945, in future correspondence concerning this project. Should you require further assistance or if you have any questions please contact Kevin Russell (602-889-5963) or Greg Beatty (602-242-0210).

Sincerely,

Shaula J. Hedwall
for
Jeffrey A. Humphrey
Field Supervisor

cc (electronic):

Fish and Wildlife Biologists, Fish and Wildlife Service, Flagstaff, AZ (Attn: Shaula Hedwall, John Nystedt, Brian Wooldridge, and Rachel Williams)
Fish and Wildlife Biologists, Fish and Wildlife Service, Phoenix, AZ (Attn: Greg Beatty, Kathy Robertson, Mary Richardson, Ryan Gordon, and Jessica Gwinn)
Fish and Wildlife Biologists, Fish and Wildlife Service, Tucson, AZ (Attn: Cat Crawford, Doug Duncan, Erin Fernandez, Jeff Servoss, and Susan Sferra)
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
Regional Threatened and Endangered Species Program Lead, U. S. Forest Service, Albuquerque, NM
Deputy Director, Wildlife, Fish, and Rare Plants, U. S. Forest Service, Albuquerque, NM
Threatened and Endangered Species Program Assistant, Wildlife, U.S. Forest Service, Albuquerque, NM

Regional NEPA Coordinator, U. S. Forest Service, Albuquerque, NM
Rights-of-Way and Special Uses Group Leader, U. S. Forest Service, Albuquerque, NM
Forest Supervisor, Apache-Sitgreaves National Forest, Springerville, AZ
Forest Supervisor, Coconino National Forest, Flagstaff, AZ
Forest Supervisor, Kaibab National Forest, Williams, AZ
Forest Supervisor, Prescott National Forest, Prescott, AZ
Forest Supervisor, Tonto National Forest, Phoenix, AZ
Natural Resource Specialist, Arizona Public Service, Flagstaff, AZ
Environmental Manager, Fort McDowell Yavapai Nation, Fountain Hills, AZ
Natural Resources Director, Havasupai Tribe, Supai, AZ
Natural Resources Director, Hualapai Tribe, Peach Springs, AZ
Natural Resources Director, Hopi Tribe, Kykotsmovi, AZ
Environmental Program Director, Kaibab Band of Paiute Indians, Fredonia, AZ
Director, Department of Fish and Wildlife, Navajo Nation, Window Rock, AZ
Manager, Environmental Protection and Resource Division, Salt River Pima-Maricopa Indian Community, Scottsdale, AZ
Director, Wildlife and Recreation Department, San Carlos Apache Tribe, San Carlos, AZ
Director, Environmental Protection Department, Tonto Apache Tribe, Payson, AZ
Sensitive Species Coordinator, White Mountain Apache Tribe, Whiteriver, AZ
Manager, Environmental Protection Department, Yavapai-Apache Nation, Camp Verde, AZ
Environmental Program Director, Yavapai-Prescott Indian Tribe, Prescott, AZ
Environmental Protection Officer, Environmental Quality Services, Western Regional Office, Bureau of Indian Affairs, Phoenix, AZ

TABLES AND FIGURES

Table 1. Forest Service approved herbicide list with vegetation treatment application and use descriptions.

Herbicide Active Ingredient/ Trade Name	Application Type				Anticipated Use Frequency[a]	Herbicide Use Description[b]
	Foliar	Cut Stump	Basal	DSAP		
Aminocyclopyrachlor/ Method	x	x	x	x	rare	Selective herbicide used for control of broadleaf weeds, woody species, vines, and grasses; pre- and post-emergent control.
Aminopyralid/ Milestone	x	x	x	x	frequent	Selective herbicide used for control of broadleaf weeds.
Chlorsulfuron/ Telar	x			x	rare	Selective herbicide that controls select broadleaf weeds and incompatible grasses; pre- and post-emergent noxious and nuisance weed control.
Clopyralid/ Transline and Reclaim	x	x	x		rare	Selective herbicide used for control of broadleaf weeds, thistles, and clovers.
2,4-D	x	x	x	x	rare	Selective herbicide that controls woody brush and broadleaf weeds.
Dicamba/ Vanquish	x	x	x	x	rare	Selective herbicide that controls select broadleaf weeds.
Fluroxypyr/ Vista	x			x	rare	Selective herbicide that controls broadleaf weeds and woody brush.
Glyphosate/ Roundup, Rodeo	x	x	x	x	frequent	Broad spectrum (non-selective) control and has an aquatic label.
Imazapic/ Plateau	x			x	rare	Selective herbicide for both the pre and post-emergent control of some annual and perennial grasses and some broadleaf weeds.
Imazapyr/ Arsenal and Habitat	x	x	x	x	moderate	Broad spectrum (non-selective) herbicide for control of a range of weeds including annual and perennial grasses, broad-leaved, woody species, and riparian and emergent aquatic species. Often used for control of invasive species.
Isoxaben/ Gallery				x	rare	Broad spectrum (non-selective) control of broadleaf weeds; pre-emergence and soil-acting herbicide
Metsulfuron methyl/ Escort	x			x	frequent	Selective herbicide used to control noxious weeds, brush and problem broadleaves with excellent grass tolerance.
Picloram/ Tordon	x	x			rare	Selective herbicide used for general woody plant control; it also controls a wide range of broad-leaved and invasive weeds; most grasses are resistant.
Sulfometuron methyl/ Oust	x			x	rare	Non-selective herbicide used to control a wide range of annual and perennial grasses as well as broad-leafed weeds.
Tebuthiuron/ Spike				x	rare	Non-selective herbicide used for control of broadleaf and woody weeds, grasses and brush; requires rainfall for incorporation into the soil for root uptake.
Triclopyr/ Garlon and Pathfinder	x	x	x	x	frequent	Selective herbicide used to control broadleaf weeds and woody vegetation.

[a] Anticipated use frequency is based on current use and knowledge of herbicide products by APS.
[b] Herbicide Use Description was populated from the herbicide product label and use and knowledge of herbicide products by APS.

Table 2. Project area width by voltage based on maximum permitted right-of way.

Line Voltage (kV)	*Project Area Width (Maximum ROW) (feet)
Distribution	20
69kV	80
115kV	130
230kV	200
345kV	200
500kV	230

Table 3. Current population status of the narrow-headed gartersnake.

Row	Location	Last Record	Suitable Physical Habitat Present	Native Prey Species Present	Harmful Nonnative Species Present
1	West Fork Gila River (NM)	2014	Yes	Yes	Yes
2	Middle Fork Gila River (NM)	2017	Yes	Yes	Yes
3	East Fork Gila River (NM)	2006	Yes	Yes	Yes
4	Gila River (AZ, NM)	2009	Yes	Yes	Yes
5	Snow Creek/Snow Lake (NM)	2012	Yes	No	Yes
6	Gilita Creek (NM)	2017	Yes	Yes	No
7	Iron Creek (NM)	2009	Yes	Yes	No
8	Little Creek (NM)	2017	Yes	Possible	Yes
9	Turkey Creek (NM)	1986	Yes	Yes	Possible
10	Beaver Creek (NM)	1949	Yes	Possible	Yes
11	Black Canyon (NM)	2010	Yes	Yes	Yes
12	Taylor Creek/Wall Lake (NM)	1960	Yes	No	Yes
13	Diamond Creek (NM)	2016	Yes	Yes	Yes
14	Tularosa River (NM)	2018	Yes	Yes	Yes
15	Whitewater Creek (NM)	2012	Yes	No	No
16	San Francisco River (NM)	2011	Yes	Yes	Yes
17	Negrito Creek (NM)	1977	Yes	Yes	Yes
18	South Fork Negrito Creek (NM)	2010	Yes	Possible	Yes
19	Blue River (AZ)	2017	Yes	Yes	Yes
20	Dry Blue Creek (AZ, NM)	2010	Yes	Possible	Yes
21	Campbell Blue Creek (AZ, NM)	2016	Yes	Possible	Yes
22	Coleman Creek (AZ)	1989	Yes	Possible	No
23	Saliz Creek (NM)	2017	Yes	Yes	No
24	Eagle Creek (AZ)	2013	Yes	Possible	Yes
25	Black River (AZ)	2017	Yes	Yes	Yes
26	East Fork Black River (AZ)	2004	Yes	Possible	Yes
27	West Fork Black River (AZ)	1991	Yes	Yes	Possible
28	Fish Creek (Tributary to East Fork Black River; AZ)	2004	Yes	Yes	Possible
29	Bear Wallow Creek (Tributary to Black River)	2003	Yes	Yes	Possible
30	North Fork Bear Wallow Creek (Tributary to Black River)	2004	Yes	Yes	Possible
31	Reservation Creek (Tributary to Black River)	2016	Yes	Yes	Yes
32	White River (AZ)	1967	Yes	Possible	Possible
33	East Fork White River (AZ)	1964	Yes	Possible	Possible
34	North Fork White River (AZ)	1986	Yes	Yes	Possible
35	Diamond Creek (AZ)	1986	Yes	Possible	Possible
36	Tonto Creek (tributary to Big Bonita Creek, AZ)	1915	Yes	Possible	Possible
37	Canyon Creek (AZ)	2017	Yes	Yes	Yes
38	Ash Creek (Tributary to Salt River)	2016	Yes	Yes	No
39	Upper Salt River (AZ)	1985	Yes	Yes	Yes
40	Cibeque Creek (AZ)	1991	Yes	Yes	Possible
41	Carrizo Creek (AZ)	1997	Yes	Yes	Possible
42	Big Bonito Creek (AZ)	1986	Yes	Yes	Yes

Table 3 (continued). Current population status of the narrow-headed gartersnake.

43	Haigler Creek (AZ)	2014	Yes	Yes	Yes
44	Houston Creek (AZ)	2005	Yes	Yes	Yes
45	Tonto Creek (tributary to Salt River, AZ)	2005	Yes	Yes	Yes
46	Christopher Creek	1993	Yes	Yes	Yes
47	Deer Creek (AZ)	1995	No	No	No
48	Upper Verde River (AZ)	2012	Yes	Yes	Yes
49	Oak Creek (AZ)	2017	Yes	No	No
50	West Fork Oak Creek (AZ)	2016	Yes	No	No
51	East Verde River (AZ)	1992	Yes	Yes	Yes

Table 4. Current population status of the northern Mexican gartersnake in the United States.

Row	Location	Last Record	Suitable Physical Habitat Present	Native Prey Species Present	Harmful Nonnative Species Present
1	Gila River (NM, AZ)	2015	Yes	Yes	Yes
2	Spring Canyon (NM)	1937	Yes	Possible	Likely
3	Duck Creek (NM)	2018	Yes	Possible	Possible
4	Mule Creek (NM)	1983	Yes	Yes	Yes
5	Mimbres River (NM)	Likely early 1900s	Yes	Yes	Yes
6	Lower Colorado River (AZ)	2015	Yes	Yes	Yes
7	Bill Williams River (AZ)	2018	Yes	Yes	Yes
8	Big Sandy River (AZ)	2016	Yes	Yes	Likely
9	Santa Maria River (AZ)	2016	Yes	Yes	Likely
10	Agua Fria River (AZ)	1985	Yes	Yes	Yes
11	Little Ash Creek (AZ)	1993	Yes	Yes	Yes
12	Lower Salt River (AZ)	1968	Yes	Yes	Yes
13	Black River (AZ)	1982	Yes	Yes	Yes
14	Big Bonito Creek (AZ)	1986	Yes	Yes	Yes
15	Tonto Creek (AZ)	2017	Yes	Yes	Yes
16	Upper /Middle Verde River (AZ)	2017	Yes	Yes	Yes
17	Oak Creek (AZ) (Aquatic Research and Conservation Center formerly known as the Page Springs and Bubbling Ponds State Fish Hatcheries)	2018	Yes	Yes	Yes
18	Spring Creek (AZ)	2014	Yes	Yes	Yes
19	Sycamore Creek (Yavapai/Coconino Co., AZ)	1954	Yes	Possible	Yes
20	Upper Santa Cruz River/San Rafael Valley (AZ)	2018	Yes	Yes	Yes
21	Redrock Canyon/Cott Drainage (AZ)	2008	Yes	Yes	Yes
22	Sonoita Creek (AZ)	2013	Yes	Possible	Yes
23	Scotia Canyon (AZ)	2018	Yes	Yes	No
24	Parker Canyon (AZ)	1986	Yes	Possible	Yes
25	Las Cienegas National Conservation Area and Cienega Creek Natural Preserve (AZ)	2017	Yes	Yes	No
26	Lower Santa Cruz River (AZ)	1960, 2015?	Yes	Yes	Yes
27	Buenos Aires National Wildlife Refuge (AZ)	2000	Yes	Yes	Yes
28	Bear Creek (AZ)	1987	Yes	Yes	Yes
29	Brown Canyon (AZ)	2014	Yes	Yes	No
30	Fort Huachuca (AZ)	1994	Yes	Yes	Yes
31	San Pedro River (AZ)	2018	Yes	Yes	Yes
32	Babocomari River and Cienega (AZ)	2009	Yes	Possible	Yes
33	Canelo Hills-Sonoita Grasslands Area (AZ)	2015	Yes	Yes	Yes
34	San Bernardino National Wildlife Refuge (AZ)	2005	Yes	Yes	Yes

Table 5. Vegetation types within the project area by National Forest.

Vegetation Type	ASNF	CNF	KNF	PNF	TNF
Arizona Alder - Willow		X		X	
Arizona Walnut	X	X		X	
Colorado Plateau / Great Basin Grassland	X	X	X	X	
Desert Willow		X		X	X
Fremont Cottonwood - Conifer					X
Fremont Cottonwood / Shrub	X	X	X	X	X
Gambel Oak Shrubland			X	X	
Herbaceous (wetland)	X	X	X		X
Historic Riparian - Agriculture		X		X	
Historic Riparian - Residential/Urban		X			X
Interior Chaparral		X		X	X
Juniper Grass		X	X	X	X
Madrean Encinal Woodland				X	X
Mixed Conifer - Frequent Fire	X	X	X	X	X
Mixed Conifer w/ Aspen	X	X		X	
Mojave-Sonoran Desert Scrub		X		X	X
Montane / Subalpine Grassland		X	X		
Mountain Mahogany Mixed Shrubland				X	
Narrowleaf Cottonwood / Shrub	X	X			X
PJ Evergreen Shrub		X		X	X
PJ Grass	X		X	X	X
PJ Woodland	X	X	X	X	X
Ponderosa Pine – Evergreen Oak		X		X	X
Ponderosa Pine / Willow			X	X	X
Ponderosa Pine Forest	X	X	X	X	X
Sagebrush Shrubland			X		
Semi-Desert Grassland		X		X	X
Sonora-Mojave Mixed Salt Desert Scrub					X
Sparsely Vegetated					X
Spruce-Fir Forest		X			
Sycamore - Fremont Cottonwood		X		X	X
Water	X	X	X	X	X
Willow - Thinleaf Alder	X				

Table 6. Power lines in southwestern willow flycatcher critical habitat and summary of maintenance actions.

Power Line	Voltage *	Length Miles	Acres	Forest	CH Unit Name	# of Areas in CH	# Poles Present	# DSAP Locations	Suitable Habitat Present	Inspection - aerial	Inspection - ground	Vegetation Maintenance	Hazard Vegetation	Vegetation Disposal	Herbicide	Herbicide ATV use	Climbing Inspection	Wood Pole Inspection	Repair and
500-3	500	0.20	5.51	TNF	Salt River	1	0	0	Riparian and upland habitat*	X	X								
CU 06	Dist OH	0.97	2.37	CNF/ PNF	Verde River – Upper S	4	13	0	Riparian and upland habitat		X	X	X	X	X	X		X	X
HD 02	Dist OH	0.11	0.27	CNF/ PNF	Verde River – Upper N	2	3	1	Riparian and upland habitat		X	X	X	X	X	X		X	X
MZT06	Dist OH	1.21	2.94	TNF	Tonto Creek	7	14	1	Foraging and upland habitat		X	X		X	X	X		X	X
MZT06	Dist UG	0.13	0.31	TNF	Tonto Creek	1	0	0	Upland habitat		X								X
NW-02	69	0.04	0.46	CNF/ PNF	Verde River – Upper N	1	0	0	Riparian and upland habitat*	X	X								
QS 02	Dist OH	0.41	0.99	CNF	Verde River – Upper N	4	6	4	Riparian and upland habitat		X	X	X	X	X	X		X	X
Totals		**3.07**	**12.85**			**20**	**36**	**6**											

*For 500-3 and NW-02, suitable riparian and upland habitat is present within the ROWs but maintenance activities beside inspections are not anticipated because lines are high above vegetation and there are no towers or poles within suitable southwestern willow flycatcher habitat. Acres were calculated very conservatively and likely represent a larger area of the floodplain than actually present. Dist OH = overhead distribution power line; Dist UG = underground distribution power line; CH = critical habitat

Table 7. Miles and acres of power line ROW in yellow-billed cuckoo proposed critical and suitable habitat and summary of maintenance actions.

Power Line	Voltage*	Length Miles	Acres*	Forest	CH Unit Name	# Poles	# DSAP	Suitable Breeding Habitat Present?	Estimated Acres of Suitable Breeding Habitat	Inspection - aerial	Inspection - ground	Vegetation Maintenance	Hazard Vegetation	Vegetation Disposal	Herbicide	Herbicide ATV use	Climbing Inspection	Wood Pole Inspection	Repair and Replacement
NW-04	69	0.35	3.59	PNF	Unit 16: AZ-8 Agua Fria River	3	0	No	0	X	X	X		X	X	X	X	X	X
500-2	500	0.10	2.19	PNF	Unit 17: AZ-9 Upper Verde River	0	0	No	0	X									
NW-02	69	0.06	0.55	CNF/PNF	Unit 17: AZ-9 Upper Verde River	0	0	Yes	0.12	X	X								
QS 02	Dist OH	0.36	3.57	CNF/PNF	Unit 17: AZ-9 Upper Verde River	5	3	Yes	0.03		X	X	X	X	X	X		X	X
QS 10	Dist OH	1.11		CNF/PNF	Unit 17: AZ-9 Upper Verde River	16	2	Yes	0.08		X	X	X	X	X	X		X	X
230-02	230	0.09	2.26	CNF/PNF	Unit 17: AZ-9 Upper Verde River	0	0	No	0	X									
CN 02	Dist OH	0.54	1.62	CNF	Unit 18: AZ-10 Oak Creek	8	0	Yes	0.29		X	X	X	X	X	X		X	X
SE 06	Dist OH	0.12		CNF	Unit 18: AZ-10 Oak Creek	2	1	Possible	0.09		X	X	X	X	X			X	X
CP 02	Dist OH	0.02		CNF	Unit 18: AZ-10 Oak Creek	0	0	No	0		X	X	X	X	X				
CP 02	Dist UG	0.27	0.64	CNF	Unit 18: AZ-10 Oak Creek	0	0	Yes	0.53										X
MG 10	Dist OH	0.38	1.63	CNF	Unit 19: AZ-11 Beaver Creek	8	1	Yes	0.92		X	X	X	X	X	X		X	X
MG 14	Dist OH	0.22		CNF	Unit 19: AZ-11 Beaver Creek	2	0	No	0		X	X		X	X	X		X	X

Power Line	Voltage*	Length Miles	Acres*	Forest	CH Unit Name	# Poles	# DSAP	Suitable Breeding Habitat Present?	Estimated Acres of Suitable Breeding Habitat	Inspection - aerial	Inspection - ground	Vegetation Maintenance	Hazard Vegetation	Vegetation Disposal	Herbicide	Herbicide ATV use	Climbing Inspection	Wood Pole Inspection	Repair and Replacement
CU 02	Dist OH	0.07		CNF	Unit 19: AZ-11 Beaver Creek	1	0	Possible	0.16		X	X	X	X	X	X		X	X
CU 06	Dist OH	0.98	2.36	CNF/PNF	Unit 20: AZ-12 Lower Verde River and West Clear Creek	15	2	Yes	0.29		X	X	X	X	X	X		X	X
CU 06	Dist UG	0.01	0.03	CNF	Unit 20: AZ-12 Lower Verde River and West Clear Creek	0	0	Possible	0.03										X
MZT06	Dist OH	1.09	2.64	TNF	Unit 22: AZ-14 Tonto Creek	14	1	Possible	0.03		X	X		X	X	X		X	X
MZT06	Dist UG	0.09	0.22	TNF	Unit 22: AZ-14 Tonto Creek	0	0	No	0										X
PZ 04	Dist OH	0.05	0.12	TNF	Unit 23: AZ-15 Pinal Creek	1	0	No	0		X	X		X	X			X	X
500-3	500	0.15	4.14	TNF	Unit 37: AZ-29 Salt River	0	0	No	0	X		X		X	X				
500-3	500	0.12	3.44	TNF	Unit 40: AZ-32 Pinto Creek South	0	0	No	0	X									
345-1	345	0.86	16.74	TNF	Unit 42: AZ-34 Lower Verde River	0	0	Yes	20.85	X									
Total w/in pCH		*7.04*	*45.75*			*75*	*10*		*23.41*										
Power Lines Located Outside of Proposed Critical Habitat																			
500-3	500	0.17	4.74	TNF	Cherry Creek	0	0	Possible	4.74	X	X	X	X	X	X	X			

Power Line	Voltage*	Length Miles	Acres*	Forest	CH Unit Name	# Poles	# DSAP	Suitable Breeding Habitat Present?	Estimated Acres of Suitable Breeding Habitat	Inspection - aerial	Inspection - ground	Vegetation Maintenance	Hazard Vegetation	Vegetation Disposal	Herbicide	Herbicide ATV use	Climbing Inspection	Wood Pole Inspection	Repair and Replacement
CN04/ NW 02	Dist OH 69	0.07	0.68	CNF	Oak Creek	0	0	No	0	X	X	X		X	X	X			
NW02	69	0.1	0.96	TNF/ CNF	Verde River	0	0	Yes	0.3	X									
NW04	69	0.1	0.96	TNF/ CNF	Verde River	0	0	Yes	0.5	X									
HD 02	Dist OH	0.11	0.26	PNF/C NF	Verde River	0	0	Yes	0.01		X	X	X	X	X	X		X	X
CZ02	Dist OH	0.1	0.2	TNF	Verde River	0	0	No	0		X	X	X	X	X			X	X
MZT0 6	Dist OH	0.03	0.08	TNF	Rye Creek	0	0	Yes	0.08		X	X	X	X	X	X		X	X
Total Outside pCH		*0.68*	*7.88*			*0*	*0*		*5.63*										
Total All Areas		**7.72**	**53.63**			**75**	**10**		**29.04**										

Suitable breeding habitat was determined using proposed critical habitat designations, survey information, Arizona Heritage Data Management System Data, and habitat descriptions contained in the listing document (U.S. Fish and Wildlife Service 2014c). *Acres in pCH were calculated by unit number and voltage. Where multiple lines with same voltage occur in a unit, acres were calculated as a group. Dist OH = overhead distribution power line; Dist UG = underground distribution power line; pCH = proposed critical habitat.

Table 8. Yellow-billed cuckoo habitat locations by National Forest.

National Forest	Yellow-billed cuckoo habitat locations	Data Type	Presence of Power Line ROWs
Coconino NF	Sycamore Creek, Oak Creek, West Clear Creek, Dry Beaver Creek, Wet Beaver Creek, Red Tank Draw, Walker Creek, Verde River	Forest Service and HDMS detections, proposed critical habitat, generalized habitat polygons, presence of breeding habitat.	ROWs cross portions of all waterways listed, except Dry Beaver Creek, and Red Tank Draw.
Prescott NF	Verde River, Ash Creek, Little Ash Creek, and Sycamore Creek (tributary to Agua Fria River)	Forest Service and HDMS detections, proposed critical habitat, generalized habitat polygons, presence of breeding habitat.	ROWs cross portions of all waterways listed.
Tonto NF	Pinal Creek, Pinto Creek, Cherry Creek, Salt River, Roosevelt Lake, Tonto Creek, Rye Creek, Verde River, Horseshoe Reservoir	Forest Service and HDMS detections, proposed critical habitat, generalized habitat polygons, presence of breeding habitat.	ROWs cross portions of all waterways except Horseshoe Reservoir
Apache Sitgreaves NFs	Blue and San Francisco Rivers	Proposed critical habitat, generalized habitat polygons	ROWs do not cross these rivers.

Table 9. Miles of power line in narrow-headed gartersnake habitat and summary of maintenance actions.

Power Line	Voltage	Length Miles	Acres	Forest	Proposed Critical Habitat Subunit Name	Number of Poles Present	Number DSAP Poles	Suitable Habitat Present?	Inspection - aerial	Inspection - ground	Vegetation Maintenance	Hazard Vegetation	Herbicide	Herbicide ATV	Vegetation Disposal	Climbing Inspection	Wood Pole Inspection	Repair & Replacement
500-3	500	0.25	6.95	TNF/ASNF	Canyon Creek	2	0	None	X	X	X		X	X	X	X		X
NE-21	69	0.43	4.10	TNF	East Verde River	1	0	Upland habitat	X	X	X		X	X	X	X	X	X
TT 14	Dist OH	5.94	14.26	TNF	East Verde River	67	7	Riparian & upland habitat		X	X	X	X	X	X		X	X
PR 06	Dist OH	0.45	1.08	TNF	Haigler Creek	3	0	Upland habitat		X	X		X	X	X		X	X
PR 06	Dist UG	0.01	0.02	TNF	Haigler Creek	0	0	None		X								X
345-1	345	0.83	15.62	TNF	Houston Creek	1	0	None	X	X	X		X	X	X	X		X
PR 02	Dist OH	0.33	0.79	TNF	Houston Creek	2	0	Riparian & upland habitat		X	X		X	X	X		X	X
PR 02	Dist UG	0.04	0.08	TNF	Houston Creek	0	0	Upland habitat		X								X
NW-02	69	0.24	5.11	CNF	Oak Creek	4	0	Upland habitat	X	X	X		X		X	X	X	X
NW-05	69	0.26		CNF	Oak Creek	5	0	Upland habitat	X	X	X		X	X	X	X	X	X
CN 02	Dist OH	2.75	31.83	CNF	Oak Creek	48	0	Riparian & upland habitat		X	X	X	X	X	X		X	X
CN 04	Dist OH	0.47		CNF	Oak Creek	0	0	Upland habitat		X	X		X	X	X		X	X
CP 02	Dist OH	0.61		CNF	Oak Creek	0	0	Upland habitat		X	X	X	X	X	X		X	X
QS 02	Dist OH	0.03		CNF	Oak Creek	1	1	Upland habitat		X	X		X		X		X	X
SE 06	Dist OH	0.63		CNF	Oak Creek	8	3	Riparian & upland habitat		X	X	X	X		X		X	X
SE 14	Dist OH	9.00		CNF	Oak Creek	175	33	Riparian & upland habitat		X	X	X	X	X	X		X	X
CP 02	Dist UG	0.44	1.15	CNF	Oak Creek	0	0	None		X								X
SE 06*	Dist UG	0.02		CNF	Oak Creek	0	0	None		X								X
SE 14*	Dist UG	0.02		CNF	Oak Creek	0	0	None		X								X
345-1	345	0.70	13.51	TNF	Tonto Creek	0	0	Riparian & upland habitat	X	X	X	X	X	X	X	X		X
MZT06	Dist OH	0.89	11.58	TNF	Tonto Creek	12	0	Upland habitat		X	X		X	X	X		X	X
PR 06	Dist OH	4.00		TNF	Tonto Creek	52	0	Riparian & upland habitat		X	X	X	X	X	X		X	X
MZT06	Dist UG	0.28	1.10	TNF	Tonto Creek	0	0	None		X								X
PR 06	Dist UG	0.18		TNF	Tonto Creek	0	0	None		X								X
NW-01	69	0.04	24.95	CNF	Verde River	0	0	Upland habitat	X	X	X		X	X	X	X	X	X

Power Line	Voltage	Length Miles	Acres	Forest	Proposed Critical Habitat Subunit Name	Number of Poles Present	Number DSAP Poles	Suitable Habitat Present?	Inspection - aerial	Inspection - ground	Vegetation Maintenance	Hazard Vegetation	Herbicide	Herbicide ATV	Vegetation Disposal	Climbing Inspection	Wood Pole Inspection	Repair & Replacement
NW-02	69	2.22		CNF/PNF/ TNF	Verde River	24	0	None	X	X	X		X		X	X	X	X
NW-04	69	0.55		CNF/TNF	Verde River	2	0	None	X	X	X		X		X	X	X	X
230-2	230	0.3	7.37	CNF/PNF	Verde River	1	0	None	X	X	X		X	X	X	X	X	
500-2	500	0.51	11.06	PNF	Verde River	0	0	None	X									
CU 06	Dist OH	1.08		PNF/CNF	Verde River	17	2	Riparian & upland habitat		X	X	X	X	X	X		X	X
CZ 02	Dist OH	1.34		CNF/TNF	Verde River	7	5	Riparian & upland habitat		X	X	X	X		X		X	X
HD 02	Dist OH	0.26	11.70	CNF/PNF	Verde River	5	1	Riparian & upland habitat		X	X	X	X	X	X		X	X
QS 02	Dist OH	1.15		CNF/PNF	Verde River	16	3	Riparian & upland habitat		X	X	X	X	X	X		X	X
QS 10	Dist OH	1.17		CNF/PNF	Verde River	14	1	Riparian & upland habitat		X	X	X	X	X	X		X	X
230-02	230	0.27	6.59	CNF	W. Fork Oak Creek	2	0	Upland habitat	X	X	X	X	X	X	X	X	X	X
Totals		**37.68**	**168.88**			**469**	**56**											

Table 10. Miles and acres of power line in northern Mexican gartersnake habitat and summary of maintenance actions.

Power Line	Voltage*	Length Miles	Acres	Forest	Proposed Critical Habitat Subunit Name	Number of Poles Present	Number of DSAP Poles	Suitable Habitat Present	Inspection - aerial	Inspection - ground	Vegetation Maintenance	Hazard Vegetation	Vegetation Disposal	Herbicide	Herbicide ATV	Climbing Inspection	Wood Pole Inspection	Repair & Replacement
NW-04	69	1.36	12.98	PNF	Little Ash Creek	12	0	Upland habitat	X	X	X		X	X	X	X	X	X
NW-02	69	0.24	2.73	COF	Oak Creek	4	0	Upland habitat	X	X	X		X	X		X	X	X
NW-05	69	0.02		CNF	Oak Creek	5	0	Upland habitat	X	X	X		X	X	X	X	X	X
CN 02	Dist OH	2.75	10.21	CNF	Oak Creek	48	0	Riparian & upland habitat		X	X	X	X	X	X		X	X
CN 04	Dist OH	0.47		CNF	Oak Creek	0	0	Upland habitat		X	X		X	X	X		X	X
CP 02	Dist OH	0.61		CNF	Oak Creek	0	0	Upland habitat		X	X	X	X	X	X		X	X
QS 02	Dist OH	0.03		CNF	Oak Creek	1	1	Upland habitat		X	X		X	X			X	X
SE 06	Dist OH	0.63		CNF	Oak Creek	8	3	Riparian & upland habitat		X	X	X	X	X			X	X
SE 06*	Dist UG	0.02	1.12	CNF	Oak Creek	0	0	None		X								X
CP 02	Dist UG	0.44		CNF	Oak Creek	0	0	None		X								X
NW-05	69	0.40	3.87	CNF	Spring Creek	5	0	Upland habitat	X	X	X		X	X	X	X	X	X
CN 02	Dist OH	0.48	3.14	CNF	Spring Creek	17	0	Upland habitat		X	X		X	X	X		X	X
CP 04	Dist OH	0.57		CNF	Spring Creek	0	0	None		X	X		X	X	X			X
WML01	Dist OH	0.24		CNF	Spring Creek	3	0	Upland habitat		X	X		X	X	X		X	X
WML01	Dist UG	0.30	0.74	CNF	Spring Creek	0	0	Upland habitat		X								X
345-1	345	0.70	13.51	TNF	Tonto Creek	0	0	Riparian & upland habitat	X	X	X	X	X	X	X			
MZT06	Dist OH	0.96	11.77	TNF	Tonto Creek	12	0	Upland habitat		X	X		X	X	X		X	X
PR 06	Dist OH	4.00		TNF	Tonto Creek	52	0	Riparian & upland habitat		X	X	X	X	X	X		X	X
MZT06	Dist UG	0.50	1.64	TNF	Tonto Creek	0	0	None		X								X
PR 06	Dist UG	0.18		TNF	Tonto Creek	0	0	None		X								X
NW-01	69	0.04	24.95	CNF	Verde River	0	0	Upland habitat	X	X	X		X	X	X	X	X	X
NW-02	69	2.22		CNF/PNF /TNF	Verde River	24	0	None	X	X	X		X	X		X	X	X
NW-04	69	0.55		CNF/TNF	Verde River	2	0	None	X	X	X		X	X		X	X	X
230-02	230	0.30	7.37	CNF/PNF	Verde River	1	0	None	X	X	X		X	X	X	X	X	
500-2	500	0.51	11.06	PNF	Verde River	0	0	None	X									
CU 06	Dist OH	1.08	11.70	PNF/CNF	Verde River	17	2	Riparian & upland habitat		X	X	X	X	X	X		X	X

Power Line	Voltage*	Length Miles	Acres	Forest	Proposed Critical Habitat Subunit Name	Number of Poles Present	Number of DSAP Poles	Suitable Habitat Present	Inspection - aerial	Inspection - ground	Vegetation Maintenance	Hazard Vegetation	Vegetation Disposal	Herbicide	Herbicide ATV	Climbing Inspection	Wood Pole Inspection	Repair & Replacement
CZ 02	Dist OH	1.34		CNF/TNF	Verde River	7	5	Riparian & upland habitat		X	X	X	X	X			X	X
HD 02	Dist OH	0.26		CNF/PNF	Verde River	5	1	Riparian & upland habitat		X	X	X	X	X	X		X	X
QS 02	Dist OH	1.15		CNF/PNF	Verde River	16	3	Riparian & upland habitat		X	X	X	X	X	X		X	X
QS 10	Dist OH	1.17		CNF/PNF	Verde River	14	1	Riparian & upland habitat		X	X	X	X	X	X		X	X
Totals		**23.54**	**116.79**			**253**	**16**											

Dist OH = overhead distribution power line, Dist UG = underground distribution power line
*This location is actually located on private land but was captured in GIS analysis due to slight data errors

Table 11. Power lines that intersect towards the middle of Protected Activity Centers.

PAC ID	PAC Name	Voltage*	Power Line Name	Miles	Acres
3090302	Big Bug	Dist. OH	PJ 01	1.65	3.95
3090305	Lorena Gulch	Dist. OH	CDS02	1.15	2.77
3090306	Smith Ravine	Dist. OH	WSP12	0.89	2.16
30402005	Snowbowl Road	Dist. OH	ELN12	0.63	1.53
30402011	Volunteer	69	NE-07	1.64	15.86
30405012	Pumphouse Wash	Dist. OH	NP 01	0.78	1.88
30405039	Kelly	69	NW-05	0.27	2.95
30405041	Lockwood	Dist. OH	CQ 12	0.15	0.37
30405041	Lockwood	Dist. UG	CQ 12	0.57	1.39
30405051	Mormon Mountain	Dist. UG	CQ 12	0.46	1.12
30407005	Blue Ridge	Dist. OH	BR 12	0.57	1.39
30407012	Rock Crossing	Dist. OH	TT 14	0.55	1.33
31204003	Upper Gordon	Dist. OH	PR 06	0.62	1.5
31204005	Strawberry	Dist. UG	STR02	0.26	0.62
31204019	Webber	Dist. OH	TT 14	0.48	1.17
31205006	Turkey Peak Northwest	Dist. OH	PR 06	0.46	1.11
31205023	Gentry	500	500-3	0.42	11.57
Totals	**16 PACs**	**15 OH and 2 UG Power Lines**		**11.55**	**52.67**

Note: The Lorena Gulch PAC was affected by the Lane II Fire in 2008 but is still designated as a PAC and is included in this table. However, the area where these power lines intersect the PAC was severely burned and may no longer contain suitable habitat, but other portions of the PAC were not affected by the fire (Hedwall 2017, personal communication). *Dist. OH = overhead distribution line; Dist. UG = underground distribution line

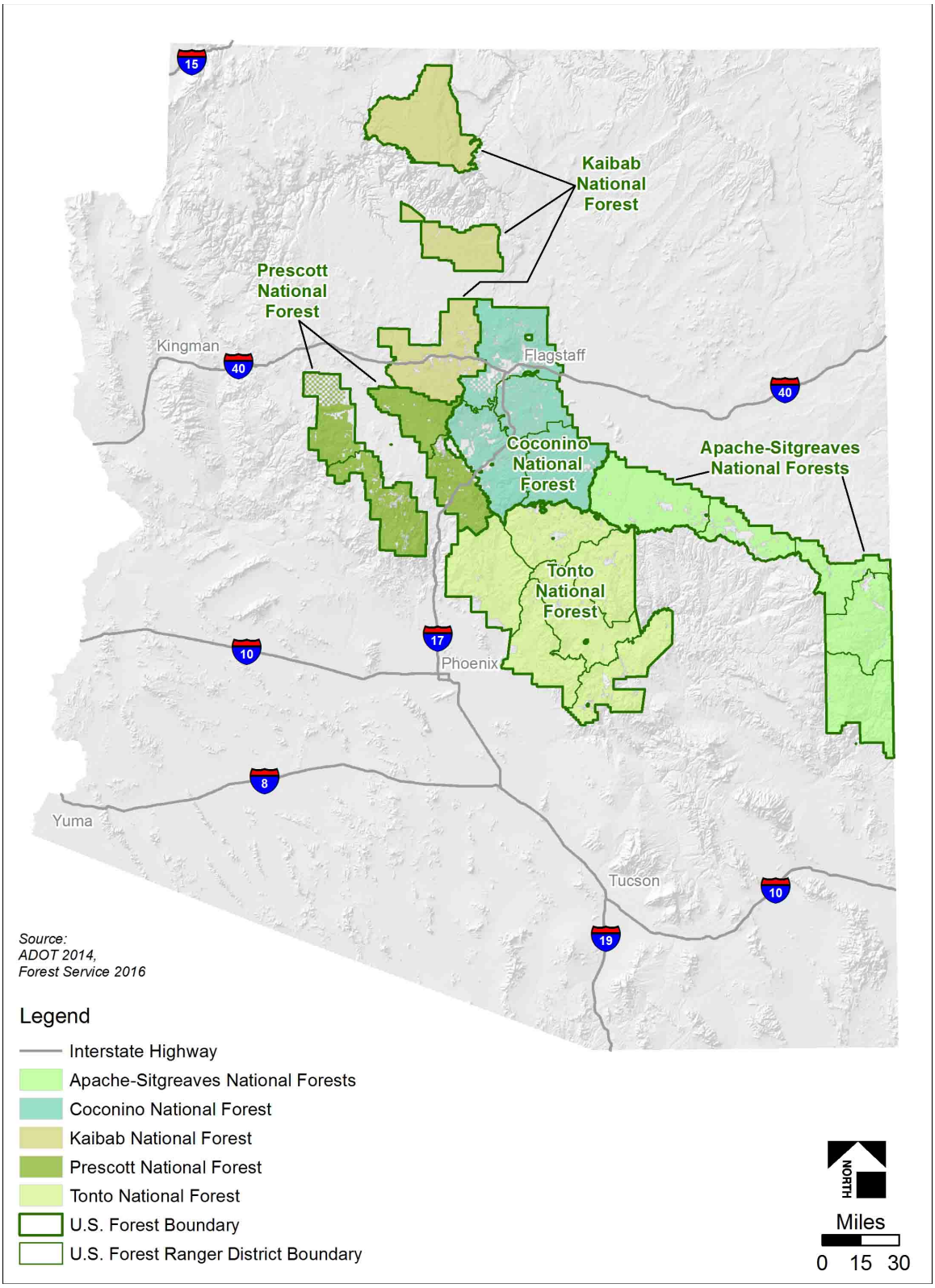

Figure 1. Project vicinity map.

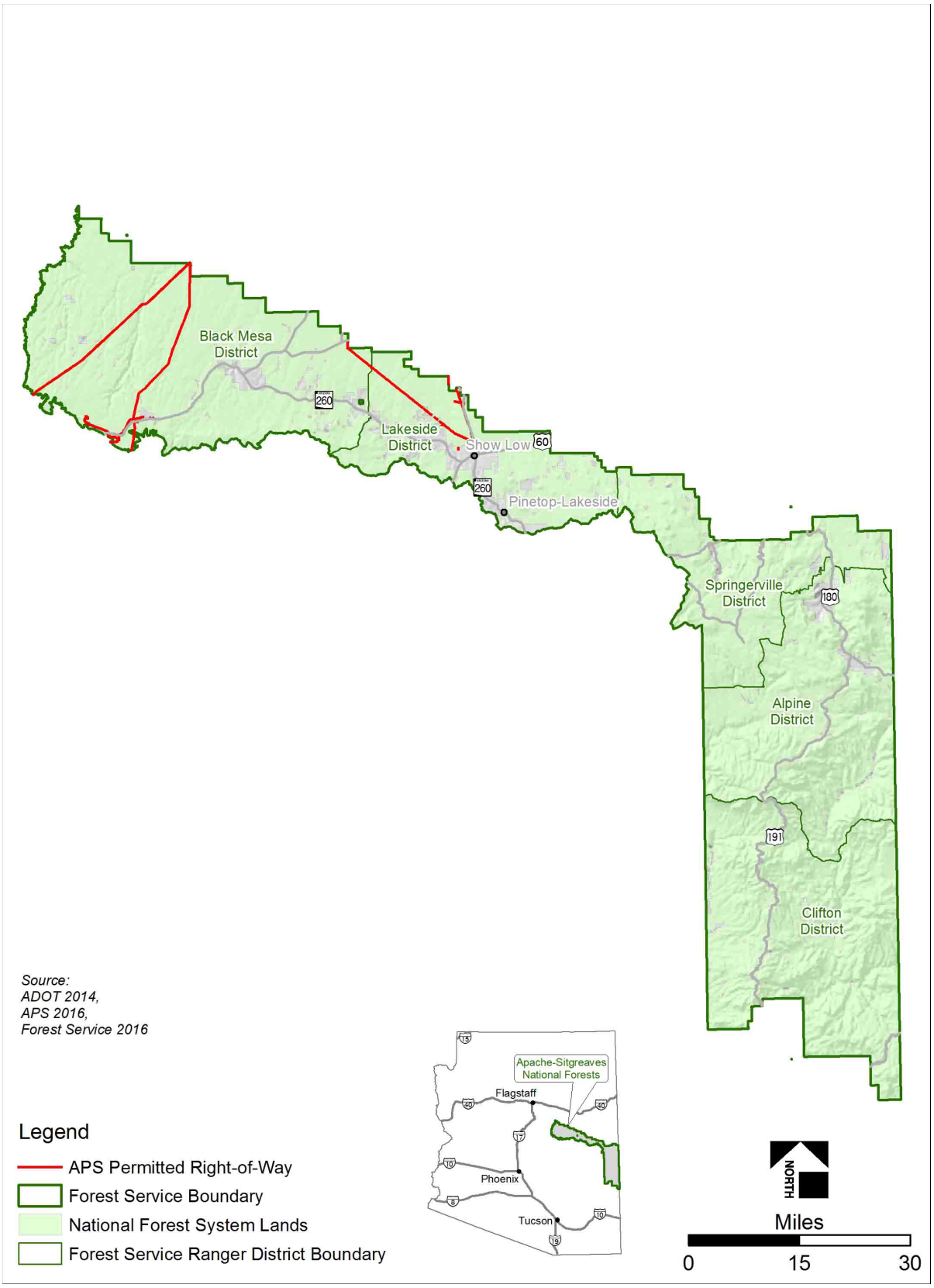

Figure 2. APS Rights-of-way within the Apache-Sitgreaves National Forests.

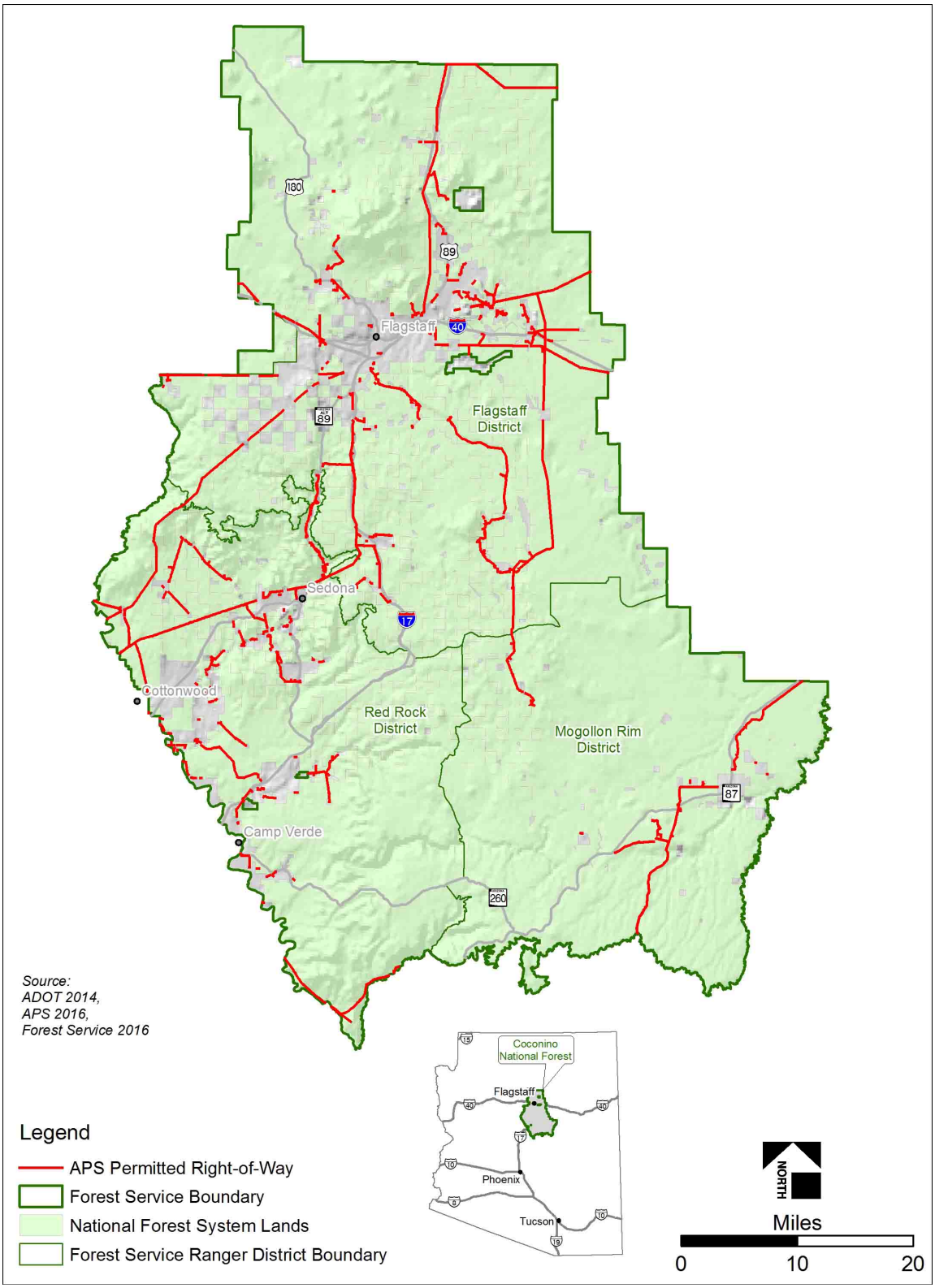

Figure 3. APS Rights-of-Way within the Coconino National Forest.

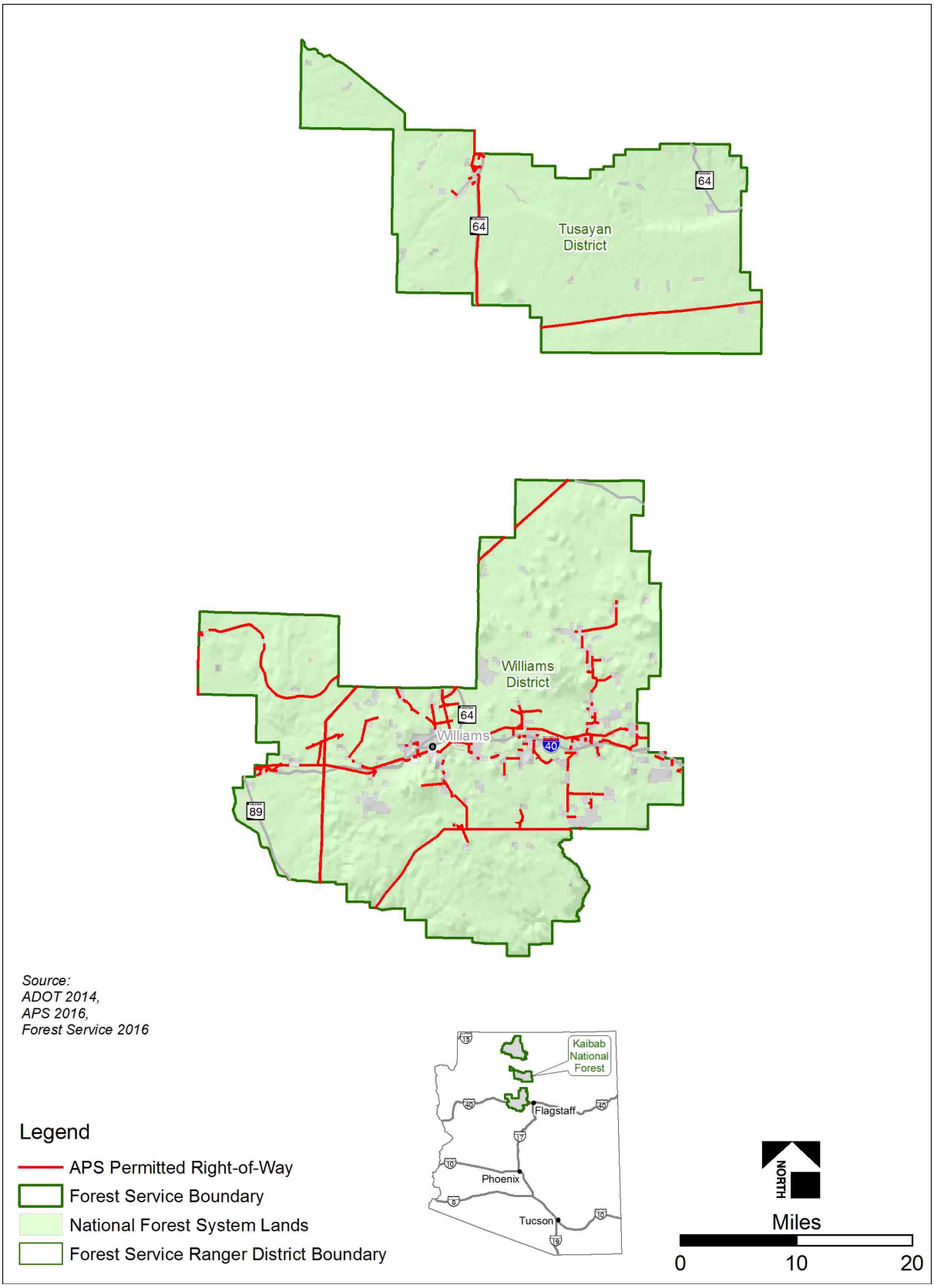

Figure 4. APS Rights-of-Way within the Kaibab National Forest.

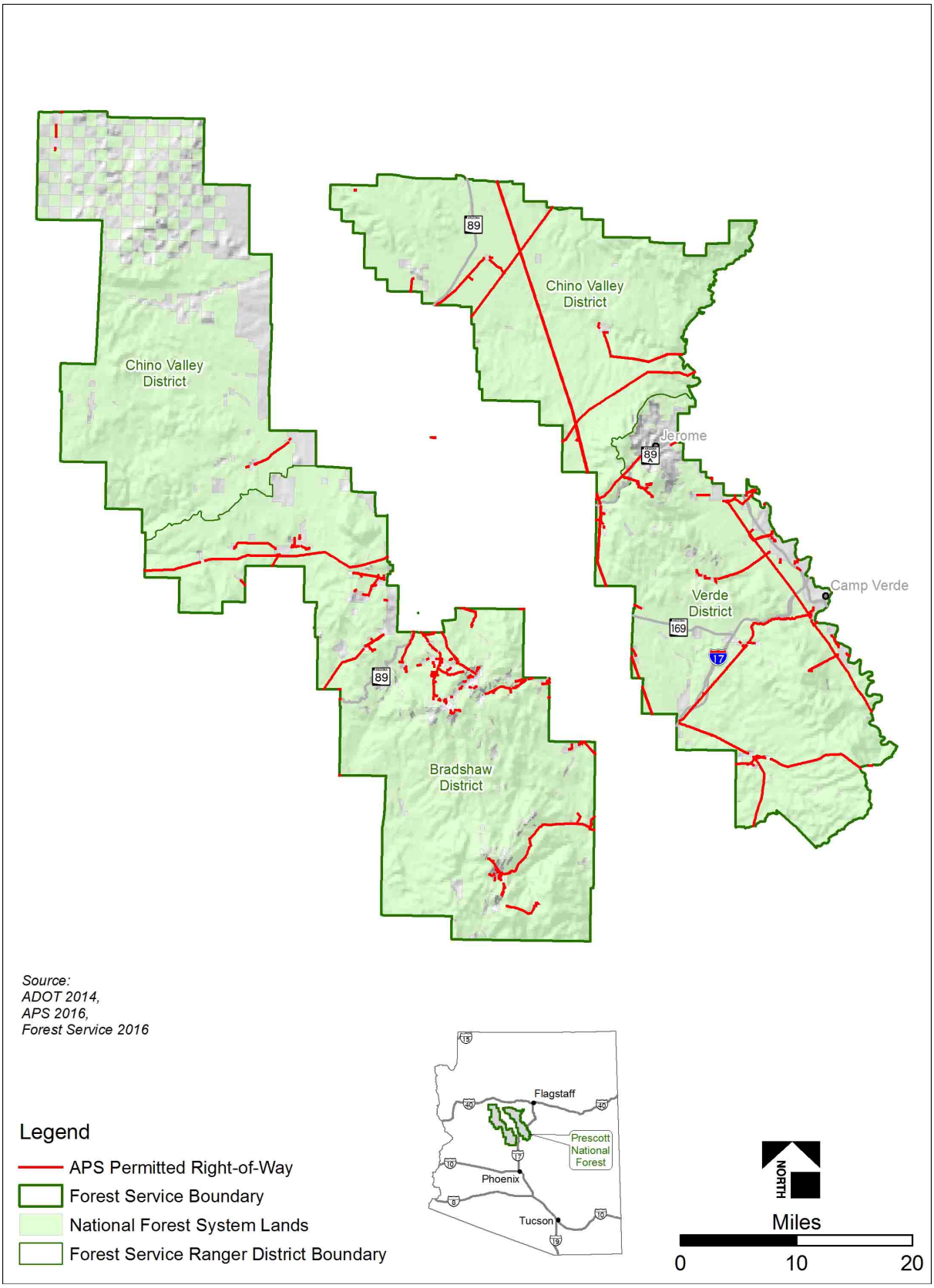

Figure 5. APS Rights-of-Way within the Prescott National Forest.

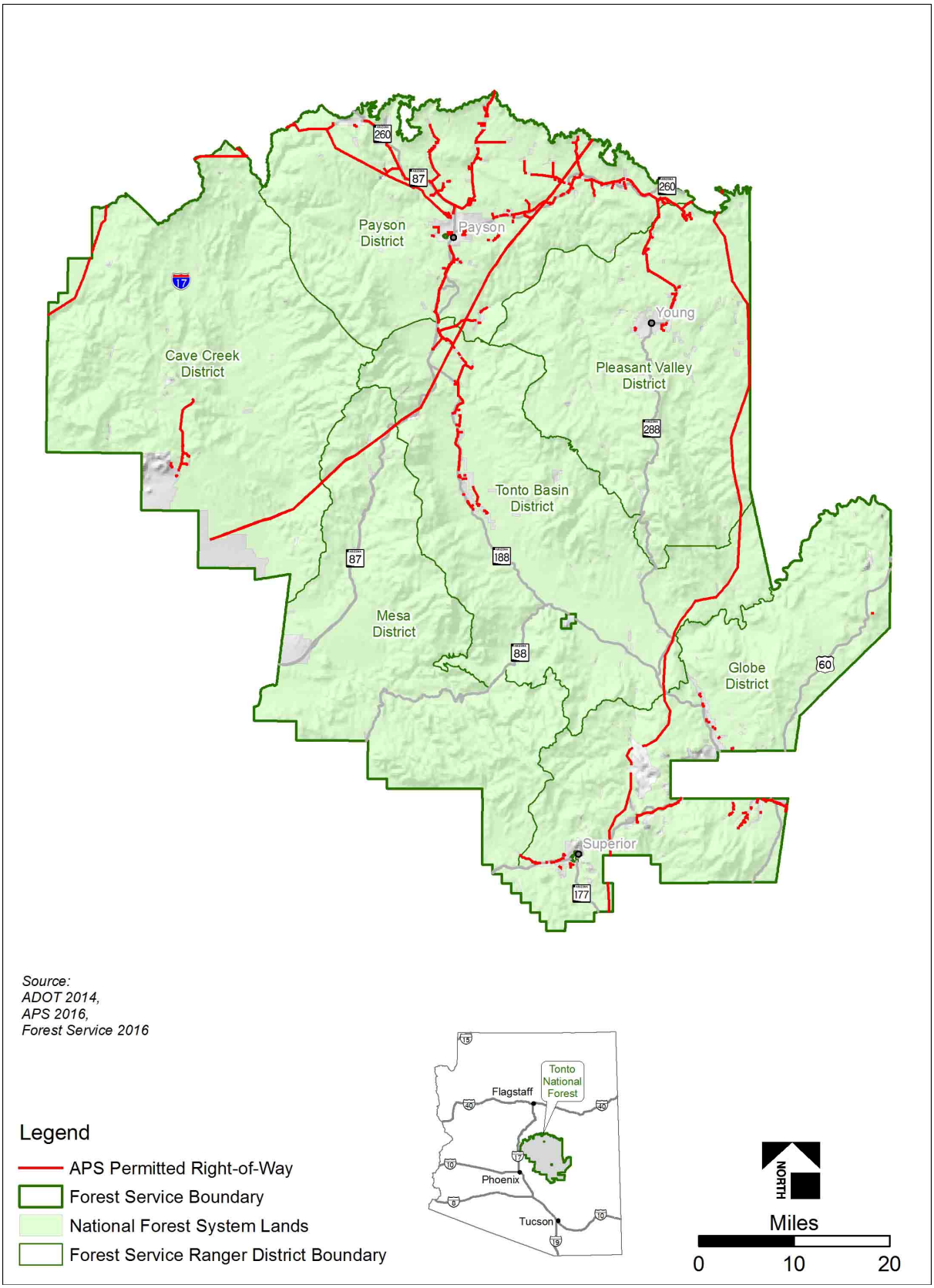

Figure 6. APS Rights-of-Way within the Tonto National Forest.

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APPENDIX A: CONCURRENCES

This appendix contains our concurrences with your "may affect, not likely to adversely affect" determinations for the endangered loach minnow (*Tiaroga cobitis*), spikedace (*Meda fulgida*), razorback sucker (*Xyrauchen texanus*), Gila chub (*Gila intermedia*), and their designated critical habitats; endangered Gila topminnow (*Poeciliopsis occidentalis occidentalis*), desert pupfish (*Cyprinodon macularius*), Gila trout (*Oncorhynchus gilae*), ocelot (*Leopardus pardalis*), Arizona cliffrose (*Purshia subintegra*), and Arizona hedgehog cactus (*Echinocereus triglochidiatus var. arizonicus*); endangered California condor (*Gymnogyps californianus*), Colorado pikeminnow (*Ptychocheilus lucius*), and Mexican gray wolf (*Canis lupus baileyi*) (outside of their non-essential experimental boundaries); and threatened Little Colorado spinedace (*Lepidomeda vittata*) and its designated critical habitat. In addition, this appendix also contains your "not likely to jeopardize determinations" for the experimental, nonessential populations of, Colorado pikeminnow, California condor, and Mexican gray wolf.

Conservation measures for all riparian areas, wetlands, and aquatic habitats

To minimize effects to species that inhabit riparian areas, wetlands, and other aquatic habitats (e.g. streams, rivers, pools, and stock tanks), the Forest Service and APS will apply the following conservation measures in riparian, wetland, and aquatic habitat. Any species-specific conservation measures are identified under the appropriate sub-heading.

Species information updates

- APS will work with the Forest Service, AGFD, and Service annually to update species information (distribution, abundance, listing, etc.) to ensure that new information is collected to determine if any section 7 consultation reinitiation triggers have been met (i.e. if a new population is found where the proposed action may cause effects).

Herbicide application

- Implement the following buffers for riparian, wetlands, and other aquatic habitats when applying herbicide (adapted from White 2007 and U.S. Forest Service 2012).
    - Herbicides rated as class 0 requires no buffer. Herbicides that meet this criterion include: aminocyclopyrachlor, aminopyralid, glyphosate (aquatic formulation), imazapic, imazapyr (aquatic and nonaquatic formulations).
    - Do not apply herbicides rated as class 1 within 30 feet of the waterbody or wetland to be protected. Herbicides that meet this criterion include: chlorsulfuron, clopyralid, fluroxypyr (acid formulation), glyphosate (non-aquatic formulation), isoxaben, metsulfuron methyl, picloram, sulfometuron methyl, tebuthiuron, and triclopyr (amine salt formulation).
    - Do not apply herbicides rated as class 2 within 50 feet of the waterbody or wetland to be protected and within 10 feet of riparian vegetation, if present. Herbicides that meet this criterion include: 2,4-D (aquatic and non-aquatic amine salt formulations), dicamba, and triclopyr (ester formulation).
    - Do not apply herbicides rated as class 3 within 100 feet of the edge of the waterbody or wetland and within 20 feet of riparian vegetation, if present.

Herbicides that meet this criterion include: 2,4-D aquatic and non-aquatic ester formulations.
  - For pool habitats, do not apply herbicides within 30 feet of pools when there is no surface flow of water in and out of pool.

Noxious weeds

- Ensure that mower, track, or other off-road equipment, which has high potential to carry noxious weeds (not including service vehicles, pick-up trucks, or passenger cars), are free of soil, weeds, vegetative matter or other debris that could harbor seeds prior to entering National Forests.

- APS will contact the appropriate Forest Service Ranger District to identify known or high probability noxious weed hotspots. In those areas, APS would ensure that mower, track, or other off-road equipment, which has high potential to carry noxious weeds (not including service vehicles, pick-up trucks, or passenger cars), are free of soil, weeds, vegetative matter or other debris that could harbor seeds prior to moving equipment between line segments.

Access routes

- When feasible, safe, and efficient to conduct maintenance work or inspections, walk into areas that are inaccessible under current route conditions.

- If vehicle access obstructions (boulders, barriers, dips) must be moved, materials will be retuned and configured to original position/design when work is complete.

- Prune vegetation where feasible, and minimize the amount of vegetation pruned or removed along access routes.

- Minimize soil disturbance to reduce erosion.

- Minimize rutting and repair per coordination with appropriate Ranger District.

- Staging areas for equipment loading and unloading should be located in previously disturbed areas.

Colorado pikeminnow (outside its non-essential experimental boundaries)

We concur with your determination that the proposed action may affect, but is not likely to adversely affect Colorado pikeminnow (outside its non-essential experimental boundary). We base this concurrence on the following:

- Wildlife agencies introduced Colorado pikeminnow into the upper Salt River and middle and upper Verde River as a non-essential experimental population in the mid-1980s, and have continued to stock pikeminnow into the upper and middle sections of the Verde River periodically since the 1990s. However, there has yet to be evidence of these fish

reproducing within these two Arizona streams. It is possible that Colorado pikeminnow could have moved and persisted into Salt and Verde rivers tributaries, but it is unlikely due to their natural history as a big river fish.

As a result of the Colorado pikeminnow's likely absence in areas outside of their experimental population boundaries within the Salt and Verde River systems, we find that implementation of the proposed action is not likely to have any direct effects.

- We expect that any indirect effects to Colorado pikeminnow and its habitat outside of its non-essential experimental boundaries within the Salt and Verde River systems from herbicide application and vegetation/utility line management will be insignificant and discountable. The reasons for this are due to the implementation of aquatic buffers, low toxicity herbicide, and drip/drift controls for herbicide application; the pikeminnow's likely absence outside of the experimental boundary; and the dispersed and relatively minimal removal of riparian vegetation across the Salt and Verde River systems.

Desert pupfish and critical habitat

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the desert pupfish. We base this concurrence on the following:

- Any direct or indirect effects to desert pupfish from human access required to conduct utility line maintenance/inspection are expected to be insignificant and discountable. Helicopters will not affect pupfish because aerial flights will occur at high elevations above the stream. Vehicle use will not affect topminnow because there are no vehicle crossings within pupfish habitat. On-the-ground inspection crews occasionally "rock hopping" or standing in the stream are not expected to affect desert pupfish due to these infrequent events, the fish's ability to escape contact, and the near-absence of pupfish from the action area.

- We expect that any direct or indirect effects to desert pupfish from herbicide application will be insignificant and discountable because of the implementation of aquatic habitat buffers, low toxicity herbicide, hand application, and drip/drift controls.

- We expect that vegetation management would cause insignificant indirect effects to desert pupfish because of the near absence of pupfish within the action area and limited alteration of habitat from the small amount of vegetation removed near two possible pupfish streams (Walnut Spring and Fossil Creek).

- There is no desert pupfish critical habitat within the action area; therefore, there will not be any effects to the primary constituent elements or physical and biological features of critical habitat.

Gila chub and critical habitat

Gila chub was formerly considered a separate taxonomic entity but is now recognized, along with headwater chub and roundtail chub, as a single taxonomic species – the roundtail chub (*Gila robusta*) (82 FR 16981). We intend to reevaluate the status of the Gila chub, which is currently listed as endangered with critical habitat (67 FR 51948). However, until that evaluation is completed and potential proposed and final rules to delist the Gila chub are published, its legal status remains as an endangered species with designated critical habitat. Our effects determination in this BO reflects this status.

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

- We expect that any direct or indirect effects to Gila chub from human access required to conduct utility line maintenance/inspection would be insignificant and discountable. Helicopters will not affect Gila chub because aerial flights will occur at high elevations above the stream. One established low water vehicle crossing occurs within occupied Gila chub habitat at Silver Creek on the Tonto National Forest, but because the creek is intermittent and use will be infrequent, we expect any indirect or direct effects will be insignificant and discountable. On-the-ground inspection crews occasionally "rock hopping" or standing in the stream are not expected to contact or effect Gila chub due to these infrequent events and the fish's ability to escape contact.

- We do not expect any direct or indirect effects to Gila chub from herbicide application because of the implementation of aquatic habitat buffers, low toxicity herbicide, hand application, and drip/drift controls.

- We anticipate any indirect effect from vegetation management, treatment, and maintenance to Gila chub will be insignificant because treatment only occurs at three locations (Walker Creek, Silver Creek, and Sycamore Creek) where fish may occur, and treatments will be limited in amount at each site's utility corridor in order to prevent excess sedimentation or associated hydrologic effects.

- We anticipate insignificant effects to Gila chub critical habitat stream flow abundance, magnitude, duration, or microhabitat (PCE 1 and 2) from vegetation removal/maintenance and herbicide application because no actions will occur within the stream or directly affect/influence water or stream temperature/microhabitat, and any indirect influence from riparian vegetation removal within utility corridors will be limited (and in some areas vegetation removal is unnecessary).

- Because of the implementation of buffers when applying herbicides near streams, the site-specific nature of herbicide application, low toxicity herbicide, hand application with drift/drip controls, and limitation of vegetation removal to utility corridors, we anticipate any indirect effects to aquatic insects/plants (PCE 4) and stream pollution (PCE 3) within

Gila chub critical habitat will be insignificant.

Gila topminnow

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the Gila topminnow. We base this concurrence on the following:

- We expect that any direct or indirect effects to Gila topminnow from human access required to conduct utility line maintenance/inspection would be insignificant and discountable. Helicopters will not affect topminnow because aerial flights will occur at high elevations above the stream. Vehicles will not affect topminnow because there are no vehicle crossings within topminnow habitat. On-the-ground inspection crews occasionally "rock hopping" or standing in the stream/pond are not expected to affect desert pupfish due to these infrequent events, and the fish's ability to escape contact.

- Any direct or indirect effects to Gila topminnow from herbicide application are expected to be insignificant and discountable because of the implementation of aquatic habitat buffers, low toxicity herbicide, hand application, and drip/drift controls.

- Vegetation management is expected to cause insignificant indirect effects to Gila topminnow because of the limited alteration of habitat from the small amount of vegetation removed near three topminnow sites (Fossil, Walker, and Sycamore Creeks).

Gila trout

We concur with your determination that the proposed action may affect, but is not likely to adversely affect Gila trout. We base this concurrence on the following:

- We expect any direct or indirect effects to Gila trout from human access required to conduct utility line maintenance/inspection to be insignificant and discountable. Helicopters will not affect Gila trout because aerial flights will occur at high elevations above the stream. Two concrete low water vehicle crossings occur within anticipated occupied Gila trout habitat on the East Verde River on the Tonto National Forest (stocking is expected in 2018/2019), but because use will be infrequent and it lacks stream habitat to attract fish use, we expect any indirect or direct effects from vehicle use will be insignificant and discountable. On-the-ground inspection crews occasionally "rock hopping" or standing in the stream are not expected to contact or effect Gila trout due to these infrequent events and the fish's ability to escape contact.

- We do not expect any direct or indirect effects to Gila trout from herbicide application because of the implementation of aquatic habitat buffers, low toxicity herbicide, hand application, and drip/drift controls.

- We anticipate any indirect effect from vegetation management, treatment, and maintenance to Gila trout will be insignificant. At most streams within Gila trout habitat

(or possible introductions in the near future) utility crossings and vegetation maintenance is limited and will be restricted to utility corridors (and in some areas vegetation removal is unnecessary). Utility crossings are more frequent in Oak Creek Canyon and the East Verde River (where recreational Gila trout populations stocked under the Act's special 4(d) provision may occur now or in the near future). Due to the overall patchiness of riparian habitat in these canyons and higher velocity streams, the wide distribution of crossings, rock hardened stream channels, and vegetation removal being limited to utility corridors, we expect any indirect effects to Gila trout (i.e., increased sedimentation, stream function, etc.) will be insignificant.

Little Colorado spinedace and critical habitat

We concur with your determination that the proposed action may affect, but is not likely to adversely affect Little Colorado spinedace and its critical habitat. We base this concurrence on the following:

- We expect any direct or indirect effects to Little Colorado spinedace from human access required to conduct utility line maintenance/inspection would be insignificant and discountable. Vehicles will not affect spinedace because there are no low-water vehicle crossings used within occupied or potential habitat; helicopters will fly at high elevations above the stream. On-the-ground inspection crews occasionally "rock hopping" or standing in the stream are not expected to affect spinedace because of the infrequency of these events and the fish's ability to escape contact.

- We do not expect any direct or indirect effects to Little Colorado spinedace from herbicide application because of the distance (400-700 feet) vegetation management will occur from spinedace habitat and the implementation of aquatic buffers, low toxicity herbicide, and drip/drift controls.

- We expect that indirect effects resulting from the removal of vegetation near or adjacent to Little Colorado spinedace habitat would be insignificant. Because towers near spinedace habitat are high above riparian vegetation and approximately 400-700 feet from the stream, mechanical treatment and herbicide application is largely unnecessary and any vegetation that may be treated along these utility corridors is limited and distant enough from streams to prevent effects to hydrological function.

- There is no Little Colorado spinedace critical habitat within the action area; therefore, there will be no effects to the primary constituent elements or physical and biological features of critical habitat.

Loach minnow and critical habitat

We concur with your determination that the proposed action may affect, but is not likely to adversely affect loach minnow and its critical habitat. We base this concurrence on the following:

- We do not anticipate any direct or indirect effects to loach minnow from human access, vegetation management, or herbicide application because no loach minnow are known to occur within the action area or are low in numbers (except for possibly Fossil Creek). Loach minnow were last detected in Fossil Creek in 2014. Because the life span for loach minnow in the wild is, on average, approximately 2 years, we are not able to reasonably conclude they would be present in the action area and be affected by the action.

- We anticipate insignificant effects to loach minnow critical habitat stream flow abundance, magnitude, duration, or microhabitat (PCE 1, 4, and 6) from vegetation removal/maintenance and herbicide application because no actions will occur within the stream, influence water or stream temperature/microhabitat, and any indirect influence from riparian vegetation removal within utility corridors will be limited (and in some areas vegetation removal is unnecessary).

- Because APS will use buffers when applying herbicides near streams, the site-specific nature of the herbicide application, the low toxicity herbicide, and hand application with drift/drip controls, we anticipate any indirect effects to aquatic insects (PCE 2) and stream pollution (PCE 3) within loach minnow critical habitat will be insignificant.

- We anticipate that the proposed action of human access to utility corridors, vegetation management, and herbicide application will have an insignificant effect on non-native aquatic species abundance or distribution (PCE 5) within loach minnow critical habitat due to the lack of work in streams, and because treating/managing vegetation is not an activity which is likely to successfully transport aquatic species.

Razorback sucker and critical habitat

We concur with your determination that the proposed action may affect, but is not likely to adversely affect razorback sucker and its critical habitat. We base this concurrence on the following:

- We do not expect any direct or indirect effects to razorback sucker from human access required to conduct utility line maintenance/inspection to be insignificant and discountable. Vehicles and helicopters will not affect suckers because activities will not occur within streams. On-the-ground inspection crews occasionally "rock hopping" or standing in the stream are not expected to affect suckers due to the infrequency of these events. Because suckers are absent or occur in low numbers in central Arizona streams, it is unlikely (discountable) that the proposed action will affect these fish.

- We expect any direct or indirect effects to razorback suckers from herbicide application and vegetation management to be insignificant and discountable due to the implementation of aquatic buffers, low toxicity herbicide, and drip/drift controls. Also, because suckers are absent or occur in low numbers in central Arizona streams, it is unlikely (discountable) that the proposed action will affect these fish.

- We anticipate insignificant effects to razorback sucker critical habitat PCE 1 (stream flow abundance, magnitude, duration, and microhabitat) and PCE 2 (rearing habitat/stream channels) from vegetation removal/maintenance and herbicide application. None of the proposed actions will occur within the stream and APS proposed a limited amount of or no vegetation removal within riparian utility corridors. Therefore, these actions will not influence PCEs 1 and 2.

- We anticipate insignificant effects to razorback sucker critical habitat biological environment (PCE 3 – food supply, predation/competition) because vegetation management will not occur in the streams preventing any transfer of exotic aquatic species; herbicide application will implement aquatic buffers, low toxicity herbicides, and drip/drift controls to prevent effects to aquatic food; and vegetation removal will be limited to utility corridors (and in some areas vegetation removal is unnecessary) preventing noticeable change to aquatic and stream environment (sedimentation, stream function, microhabitat, etc.).

Spikedace and critical habitat

We concur with your determination that the proposed action may affect, but is not likely to adversely affect spikedace and its critical habitat. We base this concurrence on the following:

- We expect that any direct or indirect effects to spikedace from human access required to conduct utility line maintenance/inspection would be insignificant and discountable. Helicopters will not affect spikedace because aerial flights will occur at high elevations above the stream. On-the-ground inspection crews occasionally "rock hopping" or standing in the stream are not expected to contact or effect any spikedace due to these infrequent events, the fish's ability to escape contact, and likely absence or extremely low abundance within the action area (except for Fossil Creek). Vehicle crossings occur within spikedace habitat at Tonto Creek (near Punkin Center) and Verde River (near Fossil Creek/Verde River confluence), but do not occur along Fossil Creek. Because spikedace do not occur in Tonto Creek and do not occur at the Verde River/Fossil Creek confluence (but do occur upstream in Fossil Creek), the likelihood of injuring or killing spikedace is so low that the effect is discountable.

- We anticipate that any direct or indirect effect to spikedace and its habitat from herbicide application and vegetation management would be insignificant and discountable due to use of herbicide buffers; the site-specific nature of herbicide application; low toxicity herbicide; hand application with drift/drip controls; and relatively minimal vegetation removal along streams (and in some areas vegetation removal is unnecessary).

- We anticipate insignificant effects to spikedace critical habitat stream flow abundance, magnitude, duration, or microhabitat (PCE 1, 4, and 6) from vegetation removal/maintenance and herbicide application because no actions will occur within the stream, influence water or stream temperature/microhabitat, and any indirect influence from riparian vegetation removal within utility corridors will be limited (and in some areas vegetation removal is unnecessary).

- Because of the implementation of buffers when applying herbicides near streams, the site-specific nature of herbicide application, low toxicity herbicide, and hand application with drift/drip controls, we anticipate indirect effects to aquatic insects (PCE 2) and stream pollution (PCE 3) within spikedace critical habitat will be insignificant.

- We anticipate that the proposed action of human access, vegetation management, and herbicide application will have an insignificant effect on non-native aquatic species abundance or distribution (PCE 5) within spikedace critical habitat due to the lack of work in streams, and because treating vegetation is not an activity which is likely to successfully transport aquatic species.

Chiricahua leopard frog and critical habitat

Chiricahua leopard frog conservation measures

- When driving within Chiricahua leopard frog habitat, implement these design features which can also be found in Appendix E: Vegetation Management Design Features.
    - When working in riparian areas, wetlands, and near other aquatic habitats, access work site only on existing roads, and limit all travel on roads when damage to the road surface would result or is occurring.
    - To the degree possible, equipment staging areas and refueling areas should be located away from riparian areas and wetlands. Whenever possible, these activities should be located in previously disturbed areas.

- Biologists or other environmental specialists from APS would contact appropriate biologists from the Service, AGFD, and Forest Service on an annual basis to ensure that all project planning and implementation activities account for possible newly discovered or reestablished Chiricahua leopard frog populations.

- To the extent possible, locate ground disturbing activities outside of occupied Chiricahua leopard frog habitat, habitat restoration/creation sites, and the immediate watersheds of such habitats.

- If avoidance is not possible, APS should minimize ground disturbing activities in occupied Chiricahua leopard frog habitat, habitat restoration/creation sites, and the immediate watersheds of such habitats through the use of the least disturbing equipment (e.g., in sensitive riparian zones, use hand tools in place of motorized equipment).

- Within occupied Chiricahua leopard frog habitats, the area of disturbance of vegetation, soils, and water should be the minimum required for the project activity. Project activities should be located out of wetted sites to the extent practicable.

- If practicable, locate equipment staging areas away from occupied habitat and habitat restoration/creation sites.

- If work activities include walking through or running or driving equipment off-road through water of occupied or unoccupied Chiricahua leopard frog habitat, either delay work until the area is dry or disinfect according to the protocol outlined below (adapted from Chiricahua leopard frog recovery plan.

    - Ensure shoes and equipment is clean, dry, and disinfected before moving to another suitable habitat location.
    - Rinse equipment with tap or bottled water until all debris is removed.
    - Scrub surfaces with one percent sodium hypochlorite (household bleach).
    - Following disinfection, rise well with tap water.
    - Footwear must be completely cleaned with special attention paid to grips, cleats, and laces.
    - All equipment shall be completely dried before re-use.

Effects determination
We concur with your "may affect, not likely to adversely affect" determination for Chiricahua leopard frog and its designated critical habitat for the following reasons:

- We expect that any direct or indirect effects to Chiricahua leopard frogs from human access conducting utility line inspection would be insignificant and discountable. Helicopters will occur at high elevations above the streams/ponds and no vehicle crossings occur within frog habitat. Vehicles will mostly stay on roads, occur infrequently where dispersing frogs may occur, and only occasionally go off-road when absolutely necessary; therefore, causing frog fatalities to be unlikely. Any frog behavior alteration from on-the-ground inspection crews is unlikely, but if it does occur would be rare, infrequent, and of short duration, causing an insignificant effect.

- We expect any direct or indirect effects to Chiricahua leopard frogs from herbicide application would be insignificant and discountable because of the implementation of aquatic habitat buffers, low toxicity herbicide, hand application, and drip/drift controls. No occupied breeding frog aquatic habitat or the immediate surrounding vegetation will be treated with herbicides. Dispersing frogs possibly occurring within corridors are unlikely to be affected by herbicide due to hand application and spot treatment on individual plants such as trees or large shrubs (as opposed to broadcast spraying), not on herbaceous vegetation where frogs would more likely occur.

- Any indirect or direct effects to “breeding” Chiricahua leopard frogs from vegetation maintenance or line maintenance/repair (including underground lines) are expected to be insignificant and discountable. No vegetation treatments will occur within or immediately adjacent to occupied breeding leopard frog habitat where vegetation removal may alter aquatic habitat (i.e. microclimate, sedimentation), breeding frog behavior (from human activity), or affect individual frogs (vehicle use or tree falling). No underground line repair is expected to occur within or adjacent to breeding frog habitat.

- Any indirect or direct effects to “dispersing” Chiricahua leopard frogs from vegetation maintenance or line repair are expected to be insignificant and discountable. There are

limited amount of lines (6) in watersheds with dispersing frog habitat. Because utility corridors have previously been maintained, large tree and extensive vegetation removal is not anticipated, minimizing the time spent in dispersing frog habitat and change in habitat quality. As a result, vehicle occurrence, foot traffic, and vegetation falling to the ground is also minimized, reducing the likelihood of adverse direct effects. Any worker encounters with dispersing frogs and frog behavior alteration is expected to be rare and of short duration, resulting in an insignificant effect. Creating slash piles from treated vegetation may create temporary cover for dispersing frogs.

- We anticipate that with the implementation of conservation measures (including project coordination with species biologists and implementing recovery plan strategies to prevent/minimize disease transmission), that effects associated with chytrid fungus and disease transmission will be insignificant and discountable.

- We anticipate any effects to Chiricahua leopard frog designated critical habitat PCE 1 (aquatic breeding habitat) would be insignificant due to the proposed action occurring in areas that would not alter influence water, water flow, emergent vegetation, transfer exotic predators/disease, etc. Implementation of recovery plan guidance will minimize the risk of disease transmission throughout leopard frog habitat and project operations are not expected to have the means to transfer and distribute exotic predatory species (fish, bullfrogs, etc.) successfully. No work will involve manipulating water or emergent vegetation. While no hazard vegetation removal, maintenance of power lines infrastructure, or road maintenance is anticipated in leopard frog critical habitat, some upland vegetation maintenance (described as a "felling a few trees") is expected in the Gentry, and Cherry creeks and Parallel Canyon unit. The removal of these few upland trees is expected to have an insignificant effect to leopard frog habitat.

- We anticipate any effects to Chiricahua leopard frog designated critical habitat PCE 2 (dispersal habitat) would be insignificant due to the proposed action occurring in areas that would not alter intermittent water, organic debris, or create barriers, etc. No work will involve manipulating intermittent or perennial water sources or create barriers (dams, fencing, etc.) for dispersing frogs. Some upland vegetation maintenance (described as a "felling a few trees") may create slash that could be used as cover.

California condor (outside its nonessential experimental boundaries)

Condors are a wide-ranging species, and appear to rely primarily on areas within the non-essential experimental boundary, specifically within the Grand Canyon complex along the Colorado River corridor and the Kaibab Plateau. Condors are occasionally found in Utah, Colorado, and Wyoming, and have also been detected within the action area for this project, foraging and roosting on the Kaibab and Coconino NFs outside of the nonessential experimental boundaries and could occur as south as the Prescott NF. These instances outside of the nonessential experimental boundaries on the Kaibab, Coconino, and to a lesser extent Prescott National Forests, are not common. When condors extend beyond the experimental population boundaries, they are fully protected as endangered.

California condor conservation measures

- Contact the Arizona Ecological Services Flagstaff Office (928-556-2106) for information on the California condor before application of pesticide near release sites, nest sites, or known communal roost sites in species habitat of canyon lands and mountain ridges.

- Do not apply herbicides within 0.25 mile of currently occupied California condor nests, roosts, or release sites.

Effects determination

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the California condor (outside its nonessential experimental boundaries). We base this concurrence on the following:

- Because the proposed action occurs across a broad area of these National Forests, there is the possibility of a rare interaction between ground crews/vehicles and condors resulting in altering condor behavior, such as flushing a bird from a perch or a carcass. We think these instances, while possible to anticipate over a 20-year period, would likely be a rare or isolated incident (because condors infrequently extend beyond the experimental boundary). As a result of the rarity and the short duration and effect of any encounter, any direct effects to condors due to behavior alteration associated with on-the-ground utility vegetation maintenance activities is anticipated to be insignificant and discountable.

- We anticipate any direct effects to condors associated with aerial patrols will be insignificant and discountable. Due to the infrequency of condors using National Forests outside of the non-essential experimental boundary, it is unlikely, but not improbable that helicopter reconnaissance/patrol flights could disrupt condor behavior (in-the-air or on-the-ground). Aerial patrol helicopter flights are anticipated to occur throughout Forests annually, travel widely, and due to the project's 20-year period, a helicopter could briefly disrupt (i.e. startle, flush, re-direct, etc.) condor behavior. However, due to the infrequent instances that condors visit the Forest outside of the experimental boundary, we anticipate that these incidents will be rare, isolated, and of short duration and insignificant and discountable.

- Because of the condor's infrequent occurrence within the action area and also due to the low volume herbicide application, low toxicity, and quick drying of herbicide application on plants, any direct or indirect effects to condors are expected to be insignificant and discountable. It is not likely that any prey carcass could acquire enough herbicide toxicity to poison a condor due to the herbicide's low-toxicity, spot application, and quickness in becoming inert. And even in the extreme unlikely scenario where a carcass could occur where herbicides were applied, the herbicides low-toxicity and spot application would not likely transfer to a foraging condor on the ground.

- We anticipate insignificant and discountable indirect effects to condors and condor habitat outside the non-essential experimental boundary. No nest areas for condors occur outside of the non-essential experimental boundary, and all known nest areas in Arizona

have occurred on cliffs. As a result, we do not anticipate that the proposed vegetation management action would affect any condor nesting areas. Condors are a wide-ranging species typically without narrow habitat requirements; as a result, the linear nature of ROW vegetation management throughout the National Forests is not anticipated to alter the condors foraging, perching, or roosting environment. Because of the rarity of their visits to National Forests within the action area (but outside of the non-essential experimental boundary), the condor's wide-ranging and broad habitat requirements, and the linear scope of vegetation utility maintenance (hazard vegetation removal, herbicide application, routine vegetation maintenance, vegetation disposal, inspections of vegetation and line facilities, ground-based inspection, maintenance and repair of line facilities, vehicle travel associated with all of these activities, and maintenance of access routes), we do not anticipate that any of these on-the-ground utility vegetation management activities will adversely affect the condor's habitat needs. Therefore, the effect of any utility vegetation management activities to the condor and its habitat is anticipated to be insignificant and discountable.

Mexican gray wolf (outside its non-essential experimental boundaries)

Mexican gray wolf conservation measures

- Immediately report sightings of wolves occurring within or adjacent to ROWs to the Service and/or the National Forest where the sighting took place.

Effects determination

Mexican gray wolves that occur outside of the nonessential experimental boundary are considered Endangered. We concur with your determination that the proposed action may affect, but is not likely to adversely affect the endangered Mexican gray wolf (outside its non-essential experimental boundaries). We base this concurrence on the following:

- Because Mexican gray wolfs currently occur in Arizona's eastern mountains within the Apache Sitgreaves National Forest and White Mountain Apache and San Carlos Apache Tribal lands (within its non-essential experimental boundaries), and the non-essential experimental boundaries encompass almost the entire action area (all of the Tonto, Prescott, and Apache-Sitgreaves National Forests; the southern/central Coconino National Forest; and southern Kaibab National Forest), the proposed action is not likely to directly or indirectly effect Mexican gray wolves. However, due to the 20-year period of this project, it is possible that Mexican gray wolves could wander or expand within the action area, outside its non-essential experimental boundary.

- The likelihood of direct effects to Mexican gray wolves from vehicle/aerial inspection and ROW maintenance activities is currently discountable due to the absence of Mexican gray wolves from the action area. Should Mexican gray wolves occur outside of the experimental boundary within the action area, we anticipate any direct effects to wolves and their behavior will be insignificant due to the infrequency and height of helicopter flights; vehicle activity occurring on roads during daylight hours; wolves avoiding vegetation/herbicide application/line maintenance work sites; and the overall infrequent and short duration of any wolf behavior alteration.

- There is no expectation that Mexican gray wolves will persist in an area where herbicide applicators could spray wolves or wolves would persist in close enough proximity and be accidentally sprayed with herbicides. As a result, any direct effect from application of herbicides on Mexican gray wolves is discountable.

- The likelihood of indirect effects to Mexican gray wolves from herbicides is currently discountable due to the absence of Mexican gray wolves from the action area. Should Mexican gray wolves occur outside of the experimental boundary within the action area, we anticipate any indirect effects to wolves from herbicides will be insignificant because of the Mexican gray wolves expected low density and sparse distribution within the action area and due to the low volume herbicide application, low toxicity, and quick drying of herbicides on plants. As a result, any indirect effects to wolves by rubbing against plants treated with herbicides are expected to be insignificant.

- The likelihood of indirect effects to Mexican gray wolves from consuming poisoned prey with herbicides is currently discountable due to the absence of Mexican gray wolves from the action area. Should Mexican gray wolves occur outside of the experimental boundary within the action area, we anticipate any indirect effects to wolves from herbicide poisoning will be discountable because of the Mexican gray wolves expected low density and sparse distribution, low toxicity of herbicides to wolf prey, and the low likelihood of wolf prey being sprayed with herbicides (due to the hand and spot application directly to trees). As a result, any indirect effect to wolves from capturing and eating toxic prey for herbicide application is expected to be discountable.

- We anticipate indirect effects to Mexican gray wolves and its habitat (outside of the nonessential experimental boundary) from utility corridor vegetation maintenance will be insignificant. This is because of the limited amount of anticipated wolf habitat outside of the action area within ROWs (448 acres on the Coconino National Forest), the broad habitat requirements for wolves, and the linear aspect of utility corridor vegetation maintenance will not measurably alter wolf habitat.

Ocelot

Ocelot conservation measures

- Immediately report detections of ocelots occurring within the action area, including adjacent to ROWs, to the Service and the National Forest where the sighting took place.

Effects determination

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the ocelot. We base this concurrence on the following:

- Because of the ocelot's low density and sparse distribution in Arizona, with no ocelots currently known to occur within the action area, we anticipate any potential direct or indirect effects on the species from the proposed action are discountable.

Arizona cliffrose

Arizona cliffrose conservation measures
APS will apply the conservation measures below to the APS QS 10 distribution power line where it occurs within Arizona cliffrose suitable habitat on Coconino National Forest. APS, the Forest Service, and the Service developed these conservation measures for the proposed action.

- The QS 10 power line occurs within 0.46 acre of occupied Arizona cliffrose habitat mapped by Coconino National Forest (0.19 mile of power line) (Cottonwood population), though more suitable habitat may be present in the action area. Approximately 0.5 mile and 1.2 acres of power line, or five spans of power line, occur within or adjacent to Arizona cliffrose occupied habitat.

- Do not use a mechanical mower for routine vegetation maintenance within Arizona cliffrose suitable habitat.

- Do not apply herbicides within Arizona cliffrose suitable habitat.

- Prior to routine vegetation maintenance work, a professional biologist experienced in the identification of Arizona cliffrose will survey for Arizona cliffrose. The biologist will record and report the GPS coordinates cliffrose plants to the Forest Service and Service.

- Prior to routine vegetation maintenance work and ground disturbing line maintenance activities, locate and flag all Arizona cliffrose within and immediately adjacent to the area for avoidance.

- Avoid Arizona cliffrose during maintenance activities. Avoid cutting of, trampling of, and disposing of vegetation on Arizona cliffrose. Avoid ground disturbing work (such as pole replacement) where Arizona cliffrose is located.

- Work crews will be educated on the avoidance of Arizona cliffrose prior to scheduled work in suitable habitat. The training will include education on identifying Arizona cliffrose; reference materials to assist in avoidance in the field; a field visit, if needed, for refinement of search image; and procedures on avoiding Arizona cliffrose not found during inventory. This training may be a professionally developed written training that crews will review prior to conducting work.

- Instruct routine vegetation maintenance crews to avoid trampling or disposing of vegetation on seedling woody plants in an effort to avoid Arizona cliffrose seedlings.

- During routine vegetation maintenance, check under plants to be treated for Arizona cliffrose seedlings prior to cutting the vegetation to identify any plants missed during the survey. If crews locate a plant that could be Arizona cliffrose, take should take measures to avoid affecting the plant. If the Arizona cliffrose is protected and shaded by the "nurse plant" to be cut, either leave the target plant or selectively trim the plant so that Arizona

cliffrose continues to be protected.

- When accessing the power line ROW by vehicle from the Lime Kiln and Bill Ensign Trail for line maintenance work, a trained biologist, botanist, or other professional experience in the identification of Arizona cliffrose is to inventory the off-road driving path prior to vehicular access and identify and flag any Arizona cliffrose plants for avoidance.

- When driving vehicles off-road in the ROW in Arizona cliffrose habitat, do so during dry conditions to minimize soil disturbance.

Effects determination
The implementation of Arizona cliffrose conservation measures is essential for our concurrence.

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the Arizona cliffrose. We base this concurrence on the following:

- Because no herbicide application is proposed to occur within Arizona cliffrose habitat, we do not anticipate any direct or indirect effects from herbicides.

- Because there are no roads that access the section of utility line where Arizona cliffrose suitable habitat occurs, we do not anticipate any direct or indirect effects from access road maintenance.

- Because no vegetation management will occur to establish defensible space around poles that may spark or treat hazard vegetation, we do not anticipate any direct or indirect effects to Arizona cliffrose from these maintenance activities.

- Because there is no direct road access to the QS 10 power line, access will occur to conduct line and vegetation maintenance on two existing trails (Lime Kiln and Bill Ensign). Line maintenance access to QS 10 would occur by truck or ATV driving from this trail to the QS 10 power line ROW. Vegetation maintenance work would occur by walking to the power line. Due to the marking of plants prior to conducting work, limited area where Arizona cliffrose habitat occurs, and infrequency of these events, we anticipate that direct or indirect effects to Arizona cliffrose from line maintenance vehicle and foot access to the QS 10 line will be insignificant.

- Due to the implementation of appropriate education, identification, surveying, and marking conservation measures; “nurse plant” conservation; and the overall short duration of activities within Arizona cliffrose habitat, we anticipate any direct or indirect effects to Arizona cliffrose or its habitat from vegetation maintenance, infrastructure maintenance/ground inspections (soil disturbance) will be insignificant and discountable.

- Due to the limited amount of power line in Arizona cliffrose habitat (0.5 mile/1.2 acres), the vegetation management/treatment focus on juniper and crucifixion thorn, the persistence of smaller shrubs/plants, and implementation of education and minimization

measures, we anticipate overall vegetation management will have insignificant indirect effects to Arizona cliffrose and its habitat.

Arizona hedgehog cactus

Arizona hedgehog conservation measures

- Work crews will be educated on the avoidance of Arizona hedgehog cactus prior to scheduled work in potential habitat (USFS 2012). The training for work crews will include one or more members of the crew, and the supervisor or utility employee overseeing work. The training will include education on the appearance of Arizona hedgehog cactus; reference materials to assist in avoidance in the field; field visit, if needed, for refinement of search image; and procedures on identifying and avoiding any Arizona hedgehog or similar looking cacti not found during pre-work inventory.

- Do not use a mechanical mower for routine vegetation maintenance within Arizona hedgehog cactus occupied habitat (USFS 2012).

- For vegetation maintenance work, drive vehicles only on existing roads and utility access routes to access the ROW. Do not drive vehicles off-road within the ROW.

- Prior to each vegetation management cycle, a survey for Arizona hedgehog cactus will be conducted by a qualified botanist or other professional experienced in the identification of this plant. GPS coordinates of found plants will be recorded and reported to the Forest Service.
    - For manual cutting of vegetation, all Arizona hedgehog cacti within and immediately adjacent to the work area are to be flagged for avoidance.
    - For herbicide application, a buffer of 20 feet will be established for avoidance. No herbicide treatments would occur within the 20-foot buffer (adapted from White 2007). Any vegetation that needs treatment within the buffer zone will be selectively trimmed using manual methods only.
    - In an effort to be conservative, all Arizona hedgehog cactus and those similar to it, may be included in the flagging for avoidance.

- During vegetation management work (herbicide and manual cutting), crews will check for Arizona hedgehog cactus under target plants prior to treatment. If crews find a cactus, they will implement appropriate conservation measures to avoid the cactus.

- During manual vegetation maintenance work, if an Arizona hedgehog cactus occurs underneath, and is shaded by a shrub to be cut, the target shrub will be left untreated. In very rare circumstances, the nurse plant may be selectively trimmed in a manner to maintain the same shading protection for the Arizona hedgehog cactus. No more than 30% of the nurse plant may be trimmed.

- For herbicide application:
    - Do not use the pre-emergent herbicide isoxaben in Arizona hedgehog cactus potential habitat (White 2007).

- Do not use 2,4-D within 300 feet of occupied Arizona hedgehog cactus habitat to minimize effects to pollinators. These herbicides are rated as Class 2 or Class 3 in the pollinating toxicity group (see Table 77 in Appendix G: Herbicide Reference Tables; from White 2007).
- Conduct post-herbicide application visual inspection between two weeks and eight weeks following application of herbicide in accordance to protocols identified in Appendix H: Arizona Hedgehog Cactus Herbicide Post-Application Visual Inspection Protocol.
- APS will immediately report any misapplications of herbicide that violates the above conservation measures or result in damage to Arizona hedgehog cactus to the Forest Service and the Service. At this time, the parties will discuss potentially reinitiating consultation and any additional actions needed to protect the cactus.

- Prior to ground disturbing line maintenance activities, a qualified botanist or other professional experienced in the identification of this plant will identify all cacti within and immediately adjacent to the work area. APS will flag plants for avoidance. In an effort to be conservative, all Arizona hedgehog cactus and those similar to it, will be flagged and avoided.

- For line maintenance, drive vehicles only on existing roads and utility access routes to access the ROW. If driving off road in the ROW is necessary for line maintenance repairs, inventory, flag, and avoid Arizona hedgehog cactus prior to the work.

Effect determination
The implementation of Arizona hedgehog cactus conservation measures is essential for our concurrence.

We concur with your determination that the proposed action may affect, but is not likely to adversely affect the Arizona hedgehog cactus. We base this concurrence on the following:

- We anticipate any direct effects to Arizona hedgehog cacti from vehicles, human access, and movement throughout ROWs are not likely to occur (discountable). Pre-treatment surveys for hedgehog cactus will occur by experienced biologists/botanists; work crews will be trained about hedgehog habitat, identification, and conservation measures; sensitive Arizona hedgehog cacti herbicide buffer areas will be flagged; and vehicles will stay on existing roads for vegetation maintenance activities. If driving off road in the ROW is necessary for line maintenance repairs, inventory, flag, and avoid Arizona hedgehog cactus prior to the work.

- With the implementation of proposed conservation measures, direct effects to Arizona hedgehog cactus from herbicide application will not be likely (discountable). Arizona hedgehog cactus pre-treatment surveys will occur and additional buffers applied for herbicide treatments; drift and drip will be minimized for herbicide applications; mechanical treatments will not be used in occupied Arizona hedgehog habitat, and a variety of herbicide compounds will be restricted in hedgehog habitat. Hand applied and

spot treatment of vegetation prevents broadcast spraying, which limits the amount of herbicide use and reduces the likelihood of unintended overspray. Effective herbicide treatment may lead to reduced visits in the future and therefore, less future travel and maintenance within Arizona hedgehog cactus habitat.

- Due to the implementation of Arizona hedgehog cactus conservation measures, the height of transmission lines within hedgehog cactus habitat, the overall lack of vegetation requiring treatment due to the height of power lines and shorter stature of vegetation, we anticipate indirect and direct effects to Arizona hedgehog cactus from vegetation maintenance will be insignificant and unlikely (discountable).

- There are two APS power lines (500-3 and PZ 01) within potential hedgehog habitat (totaling about 213 of the 29,800 acres on the Tonto National Forest) and about 87 acres where hedgehog cactus is known to occur. The 87 acres of Arizona hedgehog occupied habitat within the action area is about 3% of the occupied acreage on the Tonto National Forest (2,383 acres). No underground lines occur within hedgehog cactus habitat. Because of the desert scrub, interior chaparral, pinyon and juniper, and rocky environment where hedgehog cactus and the height of power lines, few large trees and bushes/shrubs will require removal. No hedgehog cactus will be removed. Twenty-foot buffers will surround existing Arizona hedgehog cactus for herbicide applications with the exception of applications of 2,4-D, which will employ 300-foot buffers. Prior to the manual cutting of vegetation and herbicide application, plants to be treated will be searched under for Arizona hedgehog cactus that may have been missed during surveys. If an Arizona hedgehog cactus occurs underneath and is shaded by the plant to be cut, the target plant will either not be removed or will be selectively trimmed to still provide "nurse plant" protection for the Arizona hedgehog cactus. Due to the limited amount of ROWs within Arizona hedgehog habitat, the limited number of trees requiring removal, and the persistence of nurse trees, we anticipate the effects of ROW vegetation maintenance to the Arizona hedgehog cactus will be insignificant and unlikely (discountable).

APPENDIX B: CONFERENCE REPORT FOR NONESSENTIAL EXPERIMENTAL 10 (J) POPULATIONS

Colorado pikeminnow (inside non-essential experimental boundaries)

The following includes the Colorado pikeminnow conservation measures for the proposed action and our concurrence.

Colorado pikeminnow conservation measures

- To protect the Colorado pikeminnow and its habitat, the aquatic conservation measures identified at the beginning of Appendix A apply.

Effects determination

- You determined that the proposed action, within its nonessential experimental boundary, will not jeopardize the Colorado pikeminnow. Because of the Colorado pikeminnow's status as an experimental, nonessential population, these fish are treated as though they are proposed for listing for section 7 consultation purposes. By definition, an experimental nonessential population is not essential to the continued existence of the species. Thus, no proposed action effecting a designated population could lead to a jeopardy determination for the entire species.

California condor (inside nonessential experimental boundary)

The following includes the California condor conservation measures for the proposed action and our concurrence.

California condor conservation measures

To protect the California condor, the following conservation measures are to be applied to APS power lines on Coconino and Kaibab National Forests that occur north of I-40 in California condor 10(j) habitat.

- Contact the Arizona Ecological Services Flagstaff Office at 928-556-2106 for information on the California condor before application of pesticide near release sites, nest sites, or known communal roost sites in species habitat of canyon lands and mountain ridges.

- Do not apply herbicides within 0.25 mile of currently occupied California condor nests, roosts, or release sites.

Effects determination

You determined that the proposed action, within its nonessential experimental boundary, will not jeopardize the California condor.

- Because of the California condor's status as a nonessential experimental population, we treat these condors as though they are 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 effecting a designated population could lead to a jeopardy determination for the entire species.

Mexican gray wolf (inside non-essential experimental boundary)

The following includes the Mexican gray wolf conservation measures for the proposed action and our concurrence.

Mexican gray wolf conservation measures

- Immediately report sightings of wolves occurring within or adjacent to ROWs to the Service and/or the National Forest where the sighting took place.

Effects determination

You determined that the proposed action, within its nonessential experimental boundary, will not jeopardize the Mexican gray wolf.

- Because of the Mexican gray wolf's status as an experimental, non-essential population, wolves found in Arizona are treated as though they are proposed for listing for section 7 consultation purposes. By definition, an experimental non-essential population is not essential to the continued existence of the species. Thus, no proposed action effecting a designated population could lead to a jeopardy determination for the entire species.

APPENDIX C: MONITORING AND REPORTING PROCEDURES FOR THE PROPOSED ACTIONS

The Forest Service and APS, in addition to updating annual species information and following conservation measures identified in the proposed action, are expected to track activities associated with listed species (where incidental take was not anticipated) and critical habitat to determine whether the action occurring is as proposed. However, we do not expect the Forest Service and APS to report project-related activities to the Service, but shall maintain records to assess the accuracy of the analyses identified in the BA and BO to determine if any section 7 consultation reinitiation triggers have been met.

The Forest Service and APS shall provide annually (March 30 of each year the biological opinion is in effect) to the Service information that summarizes and assesses the activities conducted under this proposed action to listed species where incidental take was anticipated to occur. These species include the northern Mexican and narrow-headed gartersnakes (within critical habitat boundaries in the action area) and the Mexican spotted owl (within all PACs in the action area). The Forest Service and APS will provide information and an incidental take assessment to the Service to determine if the proposed action was accurately described and analyzed in the BA and BO, and the extent of incidental take.

Reporting of Hazard Vegetation Treatments for the Mexican Spotted Owl:

1. The GPS or geographic location of the tree(s) or vegetation
2. The power line name or number
3. The species and status of the tree(s) or vegetation (live or dead)
4. The size class of the tree (applicable to PACs; <12 inches, 12-18 inches, >18 inches)
5. The date the trees were located
6. The number, size class, and species of trees that were damaged or removed from felling the hazard tree or vegetation if applicable
7. The date(s) when the action occurred
8. The PAC where activity occurred

Reporting of Hazard Above and Underground Line Maintenance and Pole Replacement for Mexican Spotted Owls:

1. The GPS or geographic location of the treatment area
2. The power line name or number
3. A brief description of the work conducted
4. The date(s) the work was conducted
5. The PAC where activity occurred

Reporting of Above and Underground Line Maintenance and Pole Replacement Ground Disturbing Work for Mexican and Narrow-headed Gartersnakes:

1. The GPS or geographic location of the treatment area

2. The power line name or number
3. A brief description of the work conducted
4. The date(s) the work was conducted
5. The gartersnake area (stream location or other identifying feature) where activity occurred

Reporting of Routine Vegetation Maintenance for the Mexican Spotted Owl:

1. The power line name or number
2. A brief description of the activities conducted
3. Removal of live and dead trees 18 inches dbh and larger
4. A start and end point of the area treated
5. The dates when the work was conducted
6. The PAC where activity occurred

Reporting of Aerial Flights for the Mexican Spotted Owl:

APS shall track and provide a summary of unscheduled aerial flights to the best of their ability. The unscheduled aerial flights are flights that are those that occur beyond the routinely scheduled aerial patrols for vegetation management and line maintenance. Unscheduled flights typically only involve a single line and occur for various reasons. Here are a few examples: an unscheduled flight may occur to inspect a potential hazard; to drop crews and/or equipment into a remote area for work; and to aid in repair or maintenance work on power line structures. The summary of unscheduled aerial flights shall include:

1. The power line name and number
2. A brief description of the purpose of the unscheduled flight
3. Starting and ending locations of the flight
4. Landing locations, if applicable
5. Duration of flight if over multiple days
6. The dates of the flight(s)
7. The MSO PAC where activity occurred

Reporting for Narrow-Headed and Northern Mexican Gartersnakes:

In addition to the monitoring requirements for the Reasonable and Prudent Measures (#'s 2 and 3 below), we are providing (for convenience) the gartersnake monitoring and reporting identified in the proposed action (#1 below).

1. Narrow-headed and northern Mexican gartersnakes conservation measures (#'s 9 and 10) identify reporting detections of either snake within specified timeframes depending on the activity.
    a. During significant ground disturbing work, gartersnake detections must be reported to the Service within 72 hours (documentation will be compiled by the on-site biological monitor).

b. For work that does not require a biological monitor (non-ground disturbing work), any gartersnake detected on or near the worksite will be reported to the Service within approximately one week of the observation with accompanying documentation (specified in the conservation measure).
c. After any of these detections the Service, Forest Service, and APS will review all relevant information and evaluate whether further discussion and protective action is necessary to address gartersnake conservation.

2. APS and the Forest Service shall track detections of live gartersnakes during ground-disturbing activities with the presence of a biological monitor. Should a total of four individual live gartersnakes (separately or together) be detected during ground disturbing activities within any five-year period of the 20-year project (four separate five-year periods), the Forest Service and/or APS will contact this office as soon as possible to discuss whether consultation reinitiation and/or additional conservation measures are necessary.

3. APS and the Forest Service shall track the number of incidentally taken gartersnakes: not to exceed 10 individuals (any combination of the two species) over the 20-year project period. No more than 5 gartersnakes (any combination of the two species) shall be taken during any 5-year period of the project (there are four five-year periods during the project).

   Finding incidentally taken gartersnakes is difficult. Therefore, we will consider that the amount or extent of incidental take of 10 gartersnakes has been reached based on the detection of 7 physically injured or dead gartersnakes (any combination of narrow-headed and northern Mexican gartersnakes) over the 20-year project period.

   Gartersnake incidental take from this action will be confirmed and reported to the Service with the documentation guidelines identified in gartersnake conservation measure number 10 (photo records, location specifics) and descriptions of the surrounding events and location (specified above) within 72 hours, and also within its annual summary reports.

Species Updates and Incorporation of New Information

APS will work with the Forest Service, Service, and Arizona Game and Fish Department (Heritage Data Management System), to annually update any listed species information (i.e., narrow-headed gartersnake detections) to ensure that new information is incorporated and assessed relative to the proposed action.