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AESO/SE
02-21-00-F-0427

April 26, 2004

Mr. Anthony J. Como
Deputy Director, Electric Power Regulation
Office of Coal and Power Systems
Office of Fossil Energy
Department of Energy
Washington, D.C. 20585

Dear Mr. Como:

This biological opinion (BO) responds to the Department of Energy's (DOE) request for consultation pursuant to section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. *et. seq.*, ESA). Your request for formal consultation was dated November 18, 2003, and received by us on November 21, 2003. At issue are adverse impacts that may result to Pima pineapple cactus (*Coryphantha scheeri* var. *robustispina*), the cactus ferruginous pygmy-owl (pygmy-owl) (*Glaucidium brasilianum cactorum*), and lesser long-nosed bat (*Leptonycteris curasoae yerbabuenae*) from the proposed issuance of a Presidential Permit to construct a new, double-circuit, 345,000-volt transmission line from Sahuarita, Arizona to a sub-station in Nogales, Arizona, continuing south across the United States-Mexico border for approximately 60 miles into Sonora, Mexico. In addition, you have determined that the project may affect, but is not likely to adversely affect, the jaguar (*Panthera onca*), Mexican gray wolf (*Canis lupus baileyi*), Mexican spotted owl (*Strix occidentalis lucida*) and its proposed critical habitat, southwestern willow flycatcher (*Empidonax trailii extimus*), Chiricahua leopard frog (*Rana chiricahuensis*), Gila topminnow (*Poeciliopsis occidentalis occidentalis*), and Sonora chub (*Gila ditaenia*). Our concurrences are provided in Appendix A.

This biological opinion was prepared using information from the November 2003 Biological Assessment (BA) (Harris Environmental, Inc. 2003), the supplemental BA, dated March 15, 2004, information in our files, site visits, and coordination among our staffs and other knowledgeable individuals. Literature cited in this biological opinion is not a complete bibliography of all literature available on the effects of transmission corridors on the affected species, or other subjects considered in this opinion. A complete administrative record of this consultation is on file at the Arizona Ecological Services Field Office

CONSULTATION HISTORY

July 10, 2001: DOE published notice in the Federal Register of Intent to Prepare Environmental Impact Statement (EIS) for the proposed action.

April 9, 2002: First meeting with the applicant, Tucson Electric Power, (TEP), Coronado National Forest (FS), the U.S. Fish and Wildlife Service (FWS), and the biological consultants (HEG) (Harris Environmental Group, Inc.) took place to discuss the proposed action and biological concerns associated with this project.

April 16, 2002: HEG requested a species list from the FWS for the project area.

May 9, 2002: We received a request for formal consultation from DOE.

June 4, 2002: We responded to DOE that we had insufficient information to proceed with consultation.

August 11, 2003: The Draft EIS was made available for public comment until October 14, 2003. The western corridor was identified as the preferred alternative in the Draft EIS.

November 18, 2003: DOE requested formal consultation on the western corridor alternative.

December 3, 2003: a public hearing of the Arizona Corporation Commission took place. Federal agencies involved in this project were asked to appear and testify on their involvement in the process.

February 24, 2004: At the request of DOE, the White House Task Force on Energy Project Streamlining convened a meeting in Tucson, Arizona, with all of the involved Federal agencies to discuss Federal cooperation.

March 15, 2004: We received the supplement to the BA analyzing the route from the main transmission line to the sub-station in Nogales and providing additional information on Mexican spotted owl proposed critical habitat.

April 1, 2004: The draft biological opinion was provided to DOE and other Federal agencies for their review.

April 9, 2004: Comments on the draft biological opinion were received from the FS.

April 12, 2004: Comments on the draft biological opinion were received via Fax from the Arizona Game and Fish Department (AGFD).

April 15, 2004: We met with HEG and TEP to go over the comments.

BIOLOGICAL OPINION

DESCRIPTION OF THE PROPOSED ACTION

TEP and Citizens Communications (Citizens) are proposing to build a new, dual-circuit, 345,000-volt (345-KV) transmission line from the TEP South Substation in the vicinity of Sahuarita, Arizona to interconnect with Citizens' system at a Gateway Substation that TEP will construct west of Nogales, Arizona. From this point, the proposed line will continue south across the United States-Mexico border for approximately 60 miles, connecting with the Comisión Federal de Electricidad at the Santa Ana Substation. The proposed transmission line will improve Citizens' service in Nogales and allow for the transfer of electrical energy blocks between the United States and Mexico. In order to connect the proposed Gateway Substation to Citizens' existing Valencia generating station, TEP proposes to construct a 115kV transmission line between the two substations. This additional line is approximately three miles in length and is located on the north side of the City of Nogales. The Arizona Corporation Commission (ACC) ordered Citizens to improve its system by the end of 2003.

TEP has applied for a Presidential Permit from the DOE to construct the proposed transmission line. The DOE is the lead Federal agency for this project. Other Federal agencies involved in the proposed action are: FS, Bureau of Land Management (BLM), and the U.S. Section of the International Boundary and Water Commission (USIBWC). The preferred alternative, known as the Western Corridor, extends for approximately 65.7 miles, from the South Substation to the United States-Mexico border, including 9.3 miles along the El Paso Natural Gas Company gas line right-of-way (ROW). The length of the Western Corridor is 29.5 miles within the FS and approximately 1.25 miles on BLM land (Fig. 1). The Western Corridor will require approximately 446 support structures; 191 of them will be on the FS and nine on BLM lands.

TEP will use existing utility maintenance roads and ranch access roads, where available. New access will be needed in some areas. Approximately 20 miles of new temporary roads will be built on the FS and one mile of new road will be built on BLM lands. The total new temporary acres of disturbance on FS will be approximately 197 acres. Following construction, TEP will close roads not required for project maintenance and will limit access to maintenance roads, in accordance with agreements with land owners or land managers. On the FS, TEP will close existing road mileage equal to that required for project maintenance, in order to maintain current road density. The maintenance access required by TEP will be limited to roads that access selected structures, rather than a single cleared ROW leading to the United States-Mexico border. Transmission line tensioning and pulling sites, fiber-optic splicing sites, and construction yards will be obliterated within six months of the project becoming fully operational.

The proposed transmission line will consist of twelve transmission line wires, or conductors, and two neutral ground wires that will provide lightning protection and fiber optic communication on single pole support structures. The South Substation in Sahuarita will be expanded by

approximately 1.3 acres to add a switching device that will connect to the proposed line. The new Gateway Substation will be constructed within a developed industrial park north of Mariposa Road (State Route 189). The TEP portion of the site (18 acres) is within the City of Nogales. TEP will also need a fiber-optic regeneration site, and that will most likely be located approximately 10 miles southwest of Sahuarita, on private land. That site will consist of an approximate 0.5-acre fenced yard. There will be three, 3-acre construction staging areas, located near the South and Gateway Substations and the Interstate 19 (I-19)/Arivaca Road interchange and an 80-acre temporary lay down yard (located near the I-19/Arivaca Rd interchange) used during construction of the proposed line. Additional information, maps, and other details are provided in the November 2003 BA, the March 2004 BA Supplement, and the July 2003 Draft EIS, which are incorporated here by reference.

Proposed Conservation Measures

The applicant and DOE propose the following conservation measures to minimize the effects to listed species and their habitats. The following measures were documented in the November 2003 BA and the DEIS (Table 2.2-2).

General Conservation Measures

1. All construction supervisors will be required to attend environmental training, which will outline their obligation to obey applicable laws and regulations regarding wildlife and habitats (Refer to Appendix C in the November 2003 BA). This environmental training program will be approved by the FS**.** A biological monitor will be on site during all phases of construction.

2. TEP will utilize Best Management Practices (BMPs), in consultation with the FS and Arizona Department of Environmental Quality (ADEQ), to minimize project impacts on soils and water resources on National Forest System lands. TEP will also coordinate with ADEQ to develop BMPs for the remainder of the Western Corridor.

3. A Fire Prevention Plan, to be approved by the FS, will be developed to minimize the risk of accidental fire. All construction activities will adhere to this plan, and fire suppression equipment will be available to work crews. On the FS, the Fire Prevention Plan will be in conformance with Forest Service Manual 5100.

4. A hazardous material spill response plan will be developed that will describe the measures and practices to prevent, control, clean up, and report spills of fuels, lubricants, and other hazardous substances during construction operations. This plan will ensure that no hazardous materials are stored, dispensed, or transferred in streams, watercourses, or dry washes and vehicles are regularly inspected and maintained to prevent leaks.

5. An invasive species management plan, in accordance with Executive Order 13112 will be developed in coordination with the FS, Arizona State Land Department (ASLD), and

BLM to identify problem areas and mitigation measures. Only native seed will be used to rehabilitate disturbed areas. The seed mix must be approved by the land manager or owner.

6. TEP has committed to obliterate and permanently close excess, duplicative roads in the area of the powerline, up to one mile of closure for each one mile of new road, to maintain the same general road mileage in accordance with direction from the FS. TEP will monitor road closures during regularly scheduled inspection flights and/or ground inspections, and repair or replace road-closure structures as necessary following construction. The FS will coordinate with AGFD on the road closures. TEP will cooperate with landowners on all reseeding and ongoing road closure maintenance. For complete details of methods to close roads and additional mitigation measures associated with roads, refer to the November 2003 BA and to the Road Analysis, Section 1.3.2 (URS 2003).

Cactus ferruginous pygmy-owl

1. Two consecutive years of protocol surveys will be conducted before construction activities in suitable habitat. In areas where two years of consecutive protocol surveys cannot be completed, construction activities will occur outside of the breeding season (February 1-July 31). If TEP is working in suitable habitat outside of the breeding season, where two years of consecutive surveys have not taken place, TEP will not remove nesting substrate (i.e.: saguaros with cavities).

2. If a pygmy-owl is detected during construction, the following guidelines will be followed:

    a. Within Zone 1(0-100 m from the pygmy-owl Activity Center), no additional clearing of vegetation will be permitted without authorization from us nd applicable land managers. Construction-related activities may continue on land that has been cleared of vegetation provided that the level of activity does not exceed that level or intensity that was occurring at the time the territory was established. Activities that exceed this threshold cannot continue without authorization from us and applicable land managers.

    b. Within Zone 2 (100-400 m from the pygmy-owl Activity Center), no additional clearing of vegetation will be permitted without authorization from us and applicable land managers. There will be no restrictions on other construction-related activities from August 1-January 31, and construction activities during the breeding season cannot exceed the levels or intensity of activities that occurred at the time the territory was established.

    c. Within Zone 3 (400-600 m from the pygmy-owl Activity Center), there will be no additional clearing of vegetation without authorization from us and applicable land managers. There will be no restrictions on the levels or intensity of construction activity at any time of the year.

d. Within Zone 4 (greater than 600 m from the pygmy-owl Activity Center), there are no restrictions.

3. TEP will transplant those saguaros that it cannot avoid. All saguaros that it cannot avoid within the construction areas will be transplanted or replaced with minimum 6.5 ft. specimens. Transplanted saguaros will be watered at least once after planting and their survival will be monitored for two years following project completion. Within xeroriparian desertscrub and deciduous riparian areas, tree and shrub removal will be minimized to the greatest extent possible.

Southwestern willow flycatcher

Damaged deciduous riparian vegetation will be compensated with willow or cottonwood plantings at a 2:1 ratio by species. Willow and cottonwood cuttings will be collected on site.

Lesser long-nosed bat

1. Agaves within the construction zone will be transplanted or replaced with similar age and size class individuals.
2. If any new day roosts are detected during project construction, they will be identified to us and protected throughout the construction period.

Chiricahua leopard frog

1. To prevent the spread of disease, equipment cleaning stations will be established at sites to be determined in consultation with us and the FS.

2. Silt fences will be installed alongside road construction**,** extending at least 2 miles in both directions, in areas near Chiricahua leopard frog locations to keep frogs out of the construction zone. The silt fences will be removed at the end of the project and the silt dealt with properly in accordance with FS direction**.**

Pima pineapple cactus

1. TEP will purchase 36.5 acre-credits in a FWS approved conservation bank for PPC. This will protect 36.5 acres of occupied PPC habitat in the bank and compensate for the loss of PPC and its habitat from the proposed action.

2. The placement of the transmission poles and new roads will be done in a manner that avoids any direct impacts to Pima pineapple cactus. All Pima pineapple cacti located near construction areas and access routes will be clearly marked and protected.

Jaguar

Five remote cameras will be donated to the Jaguar Conservation Team to assist with the monitoring of jaguar movements across the border region. These cameras will be placed

within the Tumacacori area under permit from the FS. Consultation with us will be reinitiated if a jaguar is detected in the Tumacacori area.

Cactus ferruginous pygmy-owl (pygmy-owl)
Status of the Species/Critical Habitat

A detailed description of the life history and ecology of the pygmy-owl can be found in the *Birds of North America* (Proudfoot and Johnson 2000), *Ecology and Conservation of the Cactus Ferruginous Pygmy-owl in Arizona* (Cartron and Finch 2000), and in other information available from the Arizona Ecological Services Field Office website (arizonaes.fws.gov). Information specific to the pygmy-owl in Arizona is preliminary. Research completed in Texas has provided useful insights into the ecology of this subspecies and, in some instances, represents the best available scientific information. However, habitat and environmental conditions are somewhat different than in Arizona, and conclusions based on information developed in Texas and elsewhere may require qualification.

Species Description

The pygmy-owl is in the order Strigiformes and the family Strigidae. They are small birds of prey, averaging 6.75 inches in length. Males average 2.2 ounces with females slightly larger averaging 2.6 ounces. The pygmy-owl is reddish brown overall, with a cream-colored belly streaked with reddish brown. The crown is lightly streaked, and a pair of dark brown/black spots outlined in white occurs on the nape suggesting eyes. The species lacks ear tufts and the eyes are yellow. The tail is relatively long for an owl and is reddish brown in color with darker brown bars. Pygmy-owls have large feet and talons relative to their size.

Listing and Critical Habitat

The Arizona population of the pygmy-owl was listed as an endangered distinct population segment on March 10, 1997 (U.S. Fish and Wildlife Service 1997a) without critical habitat. In response to a court order, approximately 731,712 acres of critical habitat were designated on July 12, 1999 (U.S. Fish and Wildlife Service 1999) in areas within Pima, Cochise, Pinal, and Maricopa counties in Arizona. On January 9, 2001, a coalition of plaintiffs filed a lawsuit with the District Court of Arizona challenging the validity of the listing of the Arizona population of the pygmy-owl as an endangered species and the designation of its critical habitat. On September 21, 2001, the Court upheld the listing of the pygmy-owl in Arizona but, at our request, and without otherwise ruling on the critical habitat issues, remanded the designation of critical habitat for preparation of a new analysis of the economic and other effects of the designation (National Association of Home Builders *et al*. v. Norton, Civ.-00-0903-PHX-SRB). The Court also vacated the critical habitat designation during the remand. We published a proposed rule to redesignate critical habitat in the Federal Register on November 27, 2002 (U.S. Fish and Wildlife Service 2002). The proposal includes approximately 1,208,000 acres in portions of Pima and Pinal counties, Arizona.

The plaintiffs appealed the District Court's ruling on the listing of the pygmy-owl as a distinct population segment. On August 19, 2003, the 9th Circuit Court of Appeals rendered an opinion

regarding this appeal, which held that, although we did not arbitrarily find the Arizona pygmy-owl population to be discrete, we arbitrarily found the discrete population to be significant. The judgment of the District Court was reversed and the case was remanded to the district court for further proceedings consistent with the 9th Circuit's opinion. Prior to being remanded to the District Court, Defenders of Wildlife, intervenors on the original 2001 lawsuit, filed a petition with the 9th Circuit for rehearing, or, in the alternative, rehearing *en banc*. This petition was denied and the matter returned to the District Court, but no ruling has been issued, nor has the right to appeal been forfeited. At this writing, therefore, the pygmy-owl remains listed as endangered, and proposed critical habitat exists.

Because conservation and recovery of the pygmy-owl may rely upon a landscape mosaic of appropriate habitat, we have proposed critical habitat areas that will link a network of State, private, and Federal lands. The proposed system of critical habitat is designed to provide an interconnected system of suitable habitat essential to Arizona pygmy-owl survival and maintain the viability of groups of pygmy-owls that are dependant upon continued genetic interchange and population immigration. Two premises were considered in establishing this system: 1) protecting verified pygmy-owl sites and areas with the presence of one or more of the constituent elements within the mean straight-line dispersal distance of 5 miles from nest sites and three of the four Special Management Areas (SMAs) recommended by the recovery team; and 2) providing for the linkage of these verified sites with areas of suitable habitat for which we have adequate scientific information indicating that they are essential to the conservation of the listed population and in need of special management. A complete description of the primary constituent elements of proposed critical habitat and the proposed critical habitat units can be found in the Federal Register announcement of the proposed rule to designate critical habitat for the pygmy-owls (U.S. Fish and Wildlife Service 2002). When consulting with Federal agencies on projects that may destroy or adversely modify proposed critical habitat, we will evaluate the effects of their project on both the Unit and all critical habitat. Then we can best evaluate the scope of effects and recommend project modifications that conserve or augment the values that would otherwise potentially be lost to that particular unit.

In September 1998, we appointed the Cactus Ferruginous Pygmy-Owl Recovery Team. The Team is comprised of a Technical Group of biologists (pygmy-owl experts and raptor ecologists) and an Implementation Group that includes representatives from affected and interested parties (i.e., Federal and State agencies, local governments, the Tohono O'odham Nation, and private groups). A draft recovery plan was released for public comment in January 2003 (U.S. Fish and Wildlife Service 2003). Following consideration of the public comments and resolution of listing litigation, we will work to finalize the recovery plan.

Life History

Pygmy-owls are considered non-migratory throughout their range. There are winter (November through January) pygmy-owl location records from throughout Arizona (University of Arizona 1995; Tibbitts 1996; Abbate *et al.* 1999, 2000). These winter records suggest that pygmy-owls are found within Arizona throughout the year and do not appear to make any sort of seasonal migration.

The pygmy-owl is primarily diurnal (active during daylight) with crepuscular (active at dawn and dusk) tendencies. They can be heard making a long, monotonous series of short, repetitive notes. Pygmy-owls are most vocal and responsive during the courtship and nesting period (February through June). Male pygmy-owls establish territories using territorial-advertisement calls to repel neighboring males and attract females. Calling and defensive behavior is also manifest in nesting territories from fledging to dispersal (June through August).

Usually, pygmy-owls nest as yearlings (Abbate *et al.* 1999, Gryimek 1972), and both sexes breed annually thereafter. Territories normally contain several potential nest-roost cavities from which responding females select a nest. Hence, cavities/acre may be a fundamental criterion for habitat selection. Historically, pygmy-owls in Arizona used cavities in cottonwood, mesquite, and ash trees, and saguaro cacti for nest sites (Millsap and Johnson 1988). Recent information from Arizona indicates nests were located in cavities in saguaro cacti for all but two of the known nests documented from 1996 to 2002 (Abbate *et al.* 1996, 1999, 2000; AGFD 2003). One nest in an ash tree and one in a eucalyptus tree were the only non-saguaro nest sites (Abbate *et al.* 2000).

Pygmy-owls exhibit a high degree of site fidelity once territories (the area defended) and home ranges (the area used throughout the year) have been established (AGFD 2003). Therefore, it is important that habitat characteristics within territories and home ranges be maintained over time in order for them to remain suitable. This is important for established pygmy-owl sites, as well as new sites established by dispersing pygmy-owls.

Pygmy-owls are more likely to be affected by projects within their home range because of the species' strong site fidelity. Behaviorally, the option to seek alternative areas outside of the home range appears limited, particularly for males.

Data on the size of areas used by pygmy-owls on an annual basis in Arizona are limited. Most of the telemetry data gathered occurs during the breeding season due to the opportunity to capture the pygmy-owls and the limited battery life of transmitters. Until more complete information is available from Arizona, the home range size estimate we are using is based on telemetry work completed in Texas. In Texas, Proudfoot (1996) noted that, while pygmy-owls used between three and 57 acres during the incubation period, they defend areas up to 279 acres in the winter. Proudfoot and Johnson (2000) indicate males defend areas with radii from 1,100 - 2,000 feet. Initial results from ongoing studies in Texas indicate that the home range of pygmy-owls may also expand substantially during dry years (G. Proudfoot, pers. comm.). Therefore, a 280-acre home range is considered necessary for pygmy-owls to meet their life history requirements on an annual basis.

Little is known about the rate or causes of mortality in pygmy-owls; however, they are susceptible to predation from a wide variety of species. Documented and suspected pygmy-owl predators include great horned owls (*Bubo virginianus*), Harris' hawks (*Parabuteo unicinctus*), Cooper's hawks (*Accipiter cooperii*), screech-owls (*Otus kennicottii*), and domestic cats (*Felis domesticus*) (Abbate *et al.* 2000, AGFD 2003). Pygmy-owls may be particularly vulnerable to predation and other threats during and shortly after fledging (Abbate *et al.* 1999).

AGFD telemetry monitoring in 2002 indicated at least three of the nine young produced that year were killed by predators prior to dispersal during a year when tree species failed to leaf out due to drought conditions (AGFD 2003). Therefore, cover near nest sites may be important for young to fledge successfully (Wilcox *et al.* 1999, 2000). A number of fledgling pygmy-owls have perished after being impaled on cholla cactus, probably due to undeveloped flight skills (Abbate *et al.* 1999). In order to support successful reproduction and rearing of young, home ranges should provide trees and cacti that are of adequate size to provide cavities in proximity to foraging, roosting, sheltering, and dispersal habitats, in addition to adequate cover for protection from climatic elements and predators, in an appropriate configuration in relation to the nest site.

Vegetation communities that provide a diversity of structural layers and plant species likely contribute to the availability of prey for pygmy-owls (Wilcox *et al.* 2000). Pygmy-owls also utilize different groups of prey species on a seasonal basis. For example, lizards, small mammals, and insects are used as available during the spring and summer during periods of warm temperatures (Abbate *et al.* 1999). However, during winter months, when low temperatures reduce the activity by these prey groups, pygmy-owls likely turn to birds as their primary source of food and appear to expand their use area in response to reduced prey availability (Proudfoot 1996). Therefore, conservation of the pygmy-owl should include consideration of the habitat needs of prey species, including structural and species diversity and seasonal availability. Pygmy-owl habitat must provide sufficient prey base and cover from which to hunt in an appropriate configuration and proximity to nest and roost sites.

Free-standing water does not appear to be necessary for the survival of pygmy-owls. During many hours of research monitoring, pygmy-owls have never been observed directly drinking water (Abbate *et al.* 1999, AGFD 2003). It is likely that pygmy-owls meet much of their biological water requirements through the prey they consume. However, the presence of water may provide related benefits to pygmy-owls. The availability of water may contribute to improved vegetation structure and diversity, which improves cover availability. The presence of water also likely attracts potential prey species, improving prey availability.

Habitat

Pygmy-owls were historically recorded in association with riparian woodlands in central and southern Arizona (Bendire 1892, Gilman 1909, Johnson *et al.* 1987, Johnson *et al*. 2003). Plants present in these riparian communities included cottonwood (*Populus fremontii*), willow (*Salix* spp.), ash (*Fraxinus velutina*), and hackberry (*Celtis* spp.). However, recent records have documented pygmy-owls in a variety of vegetation communities such as riparian woodlands, mesquite (*Prosopis velutina*) bosques (Spanish for woodlands), Sonoran desertscrub, semidesert grassland, and Sonoran savanna grassland communities (see Brown 1994 for a description of these vegetation communities).

In recent years, pygmy-owls have been primarily found in the Arizona Upland Subdivision of the Sonoran desert, particularly Sonoran desertscrub (Phillips *et al.* 1964, Monson and Phillips 1981, Davis and Russell 1984, Johnson and Haight 1985, Johnsgard 1988). This subdivision is limited in its distribution, forming a narrow, curved band along the northeast edge of the Sonoran Desert from the Buckskin Mountains, southeast to Phoenix, Arizona, and south into Sonora, Mexico. It

is described as low woodland of leguminous trees with an overstory of columnar cacti and with one or more layers of shrubs and perennial succulents. Within the United States, columnar cacti include either saguaros (*Carnegiea gigantea*), or organ pipe cactus (*Stenocereus thurberi*). Trees within this subdivision include blue paloverde (*Parkinsonia floridum*), foothills paloverde (*P. microphyllum*), ironwood (*Olneya tesota*), mesquites (*Prosopis* spp.), and cat-claw acacia (*Acacia* spp.). Cacti of many species are found within this subdivision, and include many varieties of cholla and prickly pear (*Cylindropuntia and Opuntia* spp.), fish-hook barrel cactus (*Ferocactus wislizenii*), and compass barrel cactus (*F. acanthodes*) (Brown 1994). The paloverde-cacti mixed scrub series is described as developed on the bajadas and mountain slopes away from valley floors. A bajada is the area between level plains and the foot of a mountain and is dissected by arroyos, exhibiting numerous variations in slope and pattern. While there is great variation between bajadas, they are generally characterized by good drainage and slowed evaporation, resulting in enhanced growing conditions for xerophytic plants. Cacti are particularly prevalent on bajadas, and woody, spiny shrubs and small trees, and annuals are abundant. The increased diversity of plants in turn supports a diversity of wildlife species (Benson and Darrow 1981, Olin 1994). A list of plant and wildlife species associated within this subdivision can be found in Appendix II of Brown (1994), and is incorporated herein by reference.

While there are hundreds of thousands of acres of Sonoran desertscrub, not all of this plant community is suitable for pygmy-owls. Preliminary habitat assessment data appears to indicate that those areas of Sonoran desertscrub characterized by high plant species diversity, high structural diversity, and the presence of tall canopy are the areas being used by pygmy-owls (Wilcox *et al.* 2000, Flesch 2003a). These types of areas are typically located along drainages and wash systems, or in areas with better soil and moisture conditions such as bajadas. The occurrence of these areas is more limited than the overall distribution of Sonoran desertscrub.

In addition to desertscrub, pygmy-owls have also been found in riparian and xeroriparian communities and semidesert grasslands as classified by Brown (1994). Desertscrub communities are characterized by an abundance of saguaros or large trees, and a diversity of plant species and vegetation strata. Xeroriparian habitats contain a rich diversity of plants that support a wide array of prey species and provide cover. Semidesert grasslands have experienced the invasion of velvet mesquites in uplands, and linear woodlands of various tree species occur along bottoms and washes. In Arizona, these grassland communities often transition into desertscrub, which results in the availability of some saguaros for nesting.

While plant species composition differs among these communities, there are certain unifying characteristics such as the presence of vegetation in fairly dense thickets or woodlands; the presence of trees, saguaros, or organ pipe cactus large enough to support cavities for nesting; and elevations below 4,000 feet (Swarth 1914, Karalus and Eckert 1974, Monson and Phillips 1981, Johnsgard 1988, Enriquez-Rocha *et al.* 1993, Proudfoot and Johnson 2000). Large trees provide canopy cover and cavities used for nesting, while the density of mid- and lower-story vegetation provides foraging habitat and protection from predators, and it contributes to the occurrence of prey items (Wilcox *et al.* 2000). Perch substrates used by pygmy-owls for calling are typically the tallest trees available within a home range, though pygmy-owls have also been noted calling from within saguaro cavities (Flesch 2003a).

The density of trees and the amount of canopy cover preferred by pygmy-owls in Arizona has not been fully defined. However, preliminary results from a habitat selection study indicate that nest sites tend to have a higher degree of canopy cover and higher vegetation diversity than random sites (Wilcox *et al.* 2000). Overall vegetation density may not be as important as patches of dense vegetation with a developed canopy layer interspersed with open areas. Vegetation structure may be more important than species composition (Wilcox *et al.* 1999, Cartron *et al.* 2000a). This is related to the fact that canopy cover and layers of vegetation provide hunting perches, thermal cover, and promote predator avoidance regardless of species. Larger trees with greater canopy also have a greater potential to support cavities needed for nesting. Flesch (1999) indicated that areas with large trees and canopy coverage are likely important areas for pygmy-owls in the Altar Valley, though the author also noted (Flesch 2003a) that the presence of large, columnar cacti was also a potentially critical factor due to a greater availability of cavities relative to broadleaf trees. Riparian and xeroriparian areas, which are often used by pygmy-owls, are generally characterized by increased vegetation layers, higher plant diversity, and larger tree sizes because of increased moisture availability.

Species Status and Distribution

The pygmy-owl is one of four subspecies of the ferruginous pygmy-owl. It occurs from lowland central Arizona south through western Mexico to the States of Colima and Michoacan and from southern Texas south through the Mexican States of Tamaulipas and Nuevo Leon. Only the Arizona population of the pygmy-owl is listed as an endangered species (U.S. Fish and Wildlife Service 1997a).

The northernmost historical record for the pygmy-owl is from New River, Arizona, about 35 miles north of Phoenix, where Fisher (1893) reported the pygmy-owl to be "quite common" in thickets of intermixed mesquite and saguaro cactus. According to early surveys referenced in the literature, the pygmy-owl, prior to the mid-1900s, was "not uncommon," "of common occurrence," and a "fairly numerous" resident of lowland central and southern Arizona in cottonwood forests, mesquite-cottonwood woodlands, and mesquite bosques along the Gila, Salt, Verde, San Pedro, and Santa Cruz rivers and various tributaries (Breninger 1898, Gilman 1909, Swarth 1914). Additionally, pygmy-owls were detected at Dudleyville on the San Pedro River as recently as 1985 and 1986 (Hunter 1988, AGFD 2002a).

Records from the eastern portion of the pygmy-owl's range include an 1876 record from Camp Goodwin (nearby current day Geronimo) on the Gila River, and a 1978 record from Gillard Hot Springs, also on the Gila River. Pygmy-owls have been found as far west as the Cabeza Prieta Tanks, Yuma County in 1955 (Monson 1998). Hunter (1988) found fewer than 20 verified records of pygmy-owls in Arizona for the period of 1971 to 1988.

Documentation of the total number of pygmy-owls and their current distribution in Arizona is incomplete. Survey and monitoring work in Arizona resulted in documenting 41 adult pygmy-owls in 1999, 34 in 2000, 36 in 2001, 24 in 2002, and, most recently, 21 in 2003 (AGFD 2002a). Most of these pygmy-owls were distributed in four general areas: northwest Tucson, southern Pinal County, Organ Pipe Cactus National Monument, and the Altar Valley. We believe that

more pygmy-owls exist in Arizona, but systematic surveys have not been conducted in all areas of potential habitat.

In addition, recent survey information has shown pygmy-owls to be relatively numerous adjacent to and near the Arizona border in Mexico (Flesch and Steidl 2000). There also exists considerable unsurveyed habitat on the Tohono O'odham Nation, and, although we have no means of quantifying this habitat, the distribution of recent sightings on non-Tribal areas east, west, and south of the U.S. portion of the Tohono O'odham Nation lead us to reasonably conclude that these Tribal lands may support meaningful numbers of pygmy-owls. Consequently, we believe that it is highly likely that the overall pygmy-owl population in Arizona is maintained by the movement and dispersal of pygmy-owls among groups of pygmy-owls in southern Arizona and northern Mexico resulting from the connectivity of suitable habitat.

The extent to which pygmy-owls disperse across the U.S./Mexico border is unknown, but recent survey work indicates that pygmy-owls regularly occur along the border (Flesch and Steidl 2000, Flesch 2003b). However, addressing habitat connectivity and the movements of pygmy-owls within Arizona is a primary consideration in the analysis of this project due to the importance of maintaining dispersal and movement among pygmy-owl groups within Arizona.

The patchy, dispersed nature of the pygmy-owl populations in Arizona (Abbate *et al.* 2000) and Mexico (Flesch 2003b) suggests that the overall population may function as a metapopulation. A metapopulation is a set of subpopulations within an area, where movement and exchange of individuals among population segments is possible, but not routine. A metapopulation's persistence depends on the combined dynamics of the productivity of subpopulations, the maintenance of genetic diversity, the availability of suitable habitat for maintenance and expansion of subpopulations, and the replacement of subpopulations that have experienced local extinctions by the subsequent recolonization of these areas by dispersal from adjacent population segments (Hanski and Gilpin 1991, 1997). The local groups of pygmy-owls within Arizona may function as subpopulations within the context of metapopulation theory. However, more information is needed regarding the population dynamics of pygmy-owls in Arizona.

The ability and opportunity for pygmy-owls to disperse within population segments, as well as emigrate to adjacent population segments, is likely important for the long-term persistence of pygmy-owls in Arizona. Pygmy-owl dispersal patterns are just beginning to be documented. A banded juvenile in Arizona was observed in 1998 approximately 2.4 miles from its nest site following dispersal. Five young monitored with radio telemetry during 1998 were recorded dispersing from 2.17 miles to 6.5 miles for an average of 3.6 miles (Abbate *et al.* 1999). In 1999, six juveniles in Arizona dispersed from 1.4 mile to 12.9 miles for an average of 6.2 miles (Abbate *et al.* 2000). In Arizona, the maximum documented dispersal distance is 21.8 miles (AGFD 2002b).

Table 1 summarizes the numbers of pygmy-owls documented since 1993, excluding Tribal lands.

Table 1. Numbers and distribution of documented pygmy-owl locations 1993 - 2003 (Abbate *et al*. 1996, 1999, 2000, AGFD 2002a)

Area	Year	Sites	Adults	Young
Northwest Tucson	1993-1997	9	19	6
	1998	4	7	11
	1999	6	10	16
	2000	8	11	11
	2001	5	8	10
	2002	9	9	2
	2003	4	4	0
Pinal County	1993-1997	2	6	1
	1998	2	2	0
	1999	3	5	5
	2000	2	3	5
	2001	0	0	0
	2002	1	1	0
	2003	0	0	0

Altar Valley	1998	2	4	unknown
	1999	14	18	11
	2000	6	8	4
	2001	11	18	12
	2002	8	10	7
	2003	5	9	16
Area	**Year**	**Sites**	**Adults**	**Young**
Organ Pipe Cactus National Monument and Cabeza Prieta National Wildlife Refuge	1993-1997	2	2	0
	1998	1	2	4
	1999	3	4	unknown
	2000	6	8	0
	2001	7	10	5
	2002	3	4	0
	2003	5	6?	0

With so few individual pygmy-owls in Arizona, the maximum dispersal distance may be periodically needed to maintain genetic interchange between groups of pygmy-owls. Results of preliminary genetic analysis (Proudfoot and Slack 2001) and observations of incestuous breeding provide evidence that genetic variability may be low within northwest Tucson. On two separate occasions in this area, siblings of the same nest were documented breeding with each other the following year (Abbate *et al.* 1999). Instances of sibling breeding may be a reflection of small isolated populations of pygmy-owls. Maintaining genetic diversity within depressed populations is important to maintain genetic stochasticity and fitness. AGFD (Abbate *et al.* 1999) has documented movement between pygmy-owl groups in southern Pinal County and northwest Tucson; maintaining this genetic interchange is important.

Juveniles typically disperse from natal areas in July and August and do not appear to defend a territory until September. They typically fly from tree to tree instead of long flights and may move up to a mile or more in a night (Abbate *et al.* 1999). Trees of appropriate size and spacing appear to be necessary for successful dispersal, but specific data describing this pattern are currently unavailable. Once dispersing male pygmy-owls settle in a territory (the area defended by a pygmy-owl), they rarely make additional movements outside of their home range. For example, spring surveys have found male juveniles in the same general location as observed the preceding autumn (Abbate *et al.* 2000). However, unpaired female dispersers may make additional movements that sometimes continue into the subsequent breeding season (AGFD 2003).

Reasons for Listing

In determining whether listing of the pygmy-owl was warranted, we were required under section 4(a)(1) of the ESA to consider five listing factors: a) the present or threatened destruction, modification, or curtailment of its habitat or range; b) overutilization for commercial, recreational, scientific, or educational purposes; c) disease or predation; d) the inadequacy of existing regulatory mechanisms; or e) other natural or manmade factors affecting its continued existence. We determined that the following three factors applied to the pygmy-owl - Arizona DPS to the extent that endangered status is appropriate (USFWS 1997a).

Factor 1 - The present or threatened destruction, modification, or curtailment of the species habitat or range.

The pygmy-owl is threatened by present and potential future destruction and modification of its habitat throughout a significant portion of its range in Arizona (Phillips *et al.* 1964, Johnson *et al.* 1979, Monson and Phillips 1981, Johnson and Haight 1985, Hunter 1988, Millsap and Johnson 1988). One of the most urgent threats to pygmy-owls in Arizona continues to be the loss and fragmentation of habitat (U.S. Fish and Wildlife Service 1997a, Abbate *et al.* 1999). The complete removal of vegetation and natural features required for many large-scale and high-density developments, and the increased fragmentation of habitat caused by urban sprawl, directly and indirectly affects the pygmy-owl (Abbate *et al.* 1999).

Factor 4 - Inadequacy of existing regulatory mechanisms.

Although the pygmy-owl in Arizona is considered nonmigratory, it is protected under the Migratory Bird Treaty Act (MBTA) (16 U.S.C. 703-712). The MBTA prohibits "take" of any migratory bird; however, unlike the ESA, there are no provisions in the MBTA preventing habitat destruction unless direct mortality or destruction of an active nest occurs. Other Federal and State regulations and policies such as the Clean Water Act, military policies (Barry M. Goldwater Range), National Park Service policy, and inclusion of the pygmy-owl on the State of Arizona's list of Species of Special Concern will not adequately protect the pygmy-owl in Arizona from further decline. There are currently no provisions under Arizona statute addressing the destruction or alteration of pygmy-owl habitat.

Factor 5 - Other natural or manmade factors affecting its continued existence.

Recent genetic research suggests that pygmy-owls in northwestern Tucson show evidence of genetic separation from other populations in Arizona and Mexico (Proudfoot and Slack 2001). They have found that the low level of genetic variation and the absence of shared haplotypes between pygmy-owls in northwestern Tucson and the remainder of the State and Mexico increase the potential for the natural divergence of this population from the rest of the pygmy-owl population in Arizona. In addition, these owls have extremely low levels of average haplotype diversity. Researchers acknowledge this may also be a product of sampling (i.e., sampling from one maternal lineage) and/or an extremely high level of inbreeding as a result of low population numbers and geographic isolation.

Application of pesticides and herbicides in Arizona occurs year-round, and these chemicals may pose a threat to the pygmy-owl. The presence of pygmy-owls in proximity to residences, golf courses, agricultural fields, and nurseries may cause direct exposure to pesticides and herbicides. Furthermore, ingestion of affected prey items may cause death or reproductive failure (Abbate *et al.* 1999). Illegal dumping of waste also occurs in areas occupied by pygmy-owls and may be a threat to pygmy-owls and their prey. In one case, drums of toxic solvents were found within one mile of a pygmy-owl detection (Abbate *et al.* 1999).

Additional Threats

Although not used as the basis of listing, we identified several other potential threats to the pygmy-owl in the final listing rule (U.S. Fish and Wildlife Service 1997a).

Recreational Birding. The pygmy-owl is highly sought by birders who concentrate at several of the remaining known locations of pygmy-owls in the United States. Oberholser (1974) and Hunter (1988) suggest that recreational birding may disturb pygmy-owls in highly visited areas, affecting their occurrence, behavior, and reproductive success. Limited, conservative bird watching is probably not harmful; however, excessive attention and playing of tape-recorded calls may at times constitute harassment and affect the occurrence and behavior of the pygmy-owl (Oberholser 1974, Tewes 1995). For example, in 1996, a resident in Tucson reported a pygmy-owl sighting that subsequently was added to a local birding hotline, and the location was added to their website on the internet. Several car loads of birders were later observed in the area of the reported location (AGFD pers. comm. 1999). As recently as 2003, concerns have been expressed by property owners that birders and others have been documented trying to get photos or see pygmy-owls at occupied sites (AGFD pers. comm.).

Predation and Disease. Little is known about the rate or causes of mortality in pygmy-owls; however, they are susceptible to predation from a wide variety of species. In Texas, eggs and nestlings were depredated by raccoons *(Procyon lotor)* and bullsnakes *(Pituophis catenifer)*. Adult and juvenile pygmy-owls are likely killed by great horned owls *(Bubo virginianus)*, Harris' hawks *(Parabuteo unicinctus)*, Cooper's hawks *(Accipiter cooperii)*, and eastern screech-owls *(Otus asio)* (Proudfoot and Johnson 2000). Similar predators are suspected in Arizona. Pygmy-owls are particularly vulnerable to predation and other threats during and shortly after fledging (Abbate *et al.* 1999). Recent research indicates that predation likely plays a key role in pygmy-

owl population dynamics, particularly after fledging and during the post-breeding season (AGFD 2003). Additional research is needed to determine the effects of predation, including nest depredation, on pygmy-owls in Arizona and elsewhere.

Hematozoa (blood parasites) may cause neonatal bacterial diarrhea, marginal anemia, and septicemia (Hunter *et al.* 1987), reducing survival and recruitment of birds. However, no evidence of hematozoa in pygmy-owls in Texas (Proudfoot and Radomski 1997) or Arizona (Proudfoot *et al.* unpubl. data) has been recorded. Trichomoniasis also can cause mortality of raptors (e.g., Cooper's hawks in Tucson) (Boal *et al.* 1998) that ingest doves and pigeons, but the effects of this disease on pygmy-owls in Arizona is unknown. Most species of raptors in the Tucson area, including small owls such as screech-owls and elf owls, have had documented cases of trichomoniasis (AGFD pers. comm.). House finches and doves are prey items for pygmy-owls in Arizona and are carriers of trichomoniasis (Abbate *et al.* 1999). Recent investigations in Texas and Arizona have indicated the regular occurrence of avian parasites in the materials inside of pygmy-owl nest cavities. The numbers of parasites may be high enough to affect nestling pygmy-owls. Hence, further study is needed in Arizona and Texas to assess the potential for diseases and parasites to affect pygmy-owl populations. West Nile Virus has been identified as the cause of a number of unusual raptor mortalities in some areas of the eastern United States. This virus is expanding to the west and the potential for infecting pygmy-owl warrants investigation and development of monitoring strategies.

Human-related Mortality. Direct and indirect human-caused mortalities (e.g., collisions with cars, glass windows, fences, power lines, domestic cats, etc.), while likely uncommon, are often underestimated, and probably increase as human interactions with pygmy-owls increase (Banks 1979, Klem 1979, Churcher and Lawton 1987). This may be particularly important in the Tucson area where pygmy-owls are located in proximity to urban development. Pygmy-owls flying into windows and fences, resulting in serious injuries or death to the birds, have been documented twice. A pygmy-owl collided into a closed window of a parked vehicle; it eventually flew off, but had a dilated pupil in one eye indicating neurological injury as the result of this encounter (Abbate *et al.* 1999). In another incident, an adult pygmy-owl was found dead at a wire fence; apparently it flew into the fence and died (Abbate *et al.* 1999). AGFD also has documented an incident of individuals shooting BB guns at birds perched on a saguaro that contained an active pygmy-owl nest. In Texas, two adult pygmy-owls and one fledgling were killed by a domestic cat. These pygmy-owls used a nest box about 245 feet from a human residence. In 2001, predation by domestic cats was also suspected by researchers in two instances in northwestern Tucson (AGFD 2003). Free-roaming cats can also affect the number of lizards, birds, and other prey species available to pygmy-owls; however, very little research has been done in the southwest on this potential problem.

Rangewide Trend

Data collection related to the pygmy-owl has only been consistent throughout the state for the past few years (see Table 1). Even with expanded survey efforts since the pygmy-owl was listed as endangered in 1997, there are still many areas within Arizona that have not been surveyed or for which survey efforts are inadequate. Because research has been conducted for only a few years and because research and survey efforts have not been comprehensive or random in nature,

it is not possible to determine population size or trend within Arizona. Additionally, the Tohono O'odham Nation supports pygmy-owls, but due to cultural and political considerations, complete information on the numbers or distribution on the Nation is not available. Given the historical distribution of pygmy-owls in Arizona, it is clear that they have declined throughout the state to the degree that they are now extremely limited in distribution (Monson and Phillips 1981, Davis and Russell 1984, Millsap and Johnson 1988, Proudfoot and Johnson 2000, Johnson *et al*. 2003). Johnson *et al*. (2003) hypothesized that large-scale water development (damming and diversion of the Salt and Verde rivers) and subsequent decline of riparian woodlands led to initial declines in species abundance and distribution.

Information gathered over the past few years indicates that pygmy-owls occur in Arizona in low numbers and are patchily distributed across southern Arizona. They occur in four main areas of the state, and numbers found within each area tend to vary on an annual basis (Table 1). Data are insufficient to determine meaningful trends, but it is likely that for the pygmy-owl to persist in Arizona, additional pygmy-owls need to be located, productivity needs to be expanded, and population support from Mexico or artificial augmentation is probably required.

Information about populations of pygmy-owls in Mexico is limited. Based on personal observations and anecdotal information, Russell and Monson (1998) recorded no decline in numbers from Sonora, Mexico. However, the first systematic surveys for pygmy-owls in Sonora were conducted in 2000 and 2001. These surveys resulted in the detection of 524 pygmy-owls along 329 transects, covering 690 miles (Flesch and Steidl 2000, Flesch 2003b). Pygmy-owls were detected throughout the state of Sonora, from the international border south to the Sonora/Sinaloa border, with the exception of the area around Hermosillo where agricultural and buffelgrass (*Pennisetum ciliaris*) conversion has impacted available habitat (Flesch 2003b). In 2000 and 2003, AGFD personnel documented, through the use of radio telemetry, the movement of two dispersing juvenile pygmy-owls into Mexico from nests just north of the international border (AGFD pers. comm.). However, while movement of pygmy-owls across the border likely occurs, we have no information regarding the extent to which this happens.

In addition, we are not aware of any management or conservation practices in Mexico that are directed towards pygmy-owls. The expansion of agricultural and urban land uses increases habitat loss and fragmentation in Mexico and the stability of pygmy-owl populations cannot be determined. In Mexico, millions of acres of Sonoran Desert and thornscrub are being converted to buffelgrass, which represents both a direct and an indirect loss of habitat because of invasion into adjacent areas and increased fire frequency and intensity (McLaughlin and Bowers 1982, Burquez-Montijo et al. 2002). Burquez and Yrizar (1997) state that the government subsidies to establish exotic introduced grasslands, to maintain large cattle herds, and to support marginal cattle ranching, the desert and thornscrub in Sonora will probably be replaced in the near term by ecosystems with significantly lower species diversity and reduced structural complexity, unless control measures are implemented. Such replacement is and will continue to affect pygmy-owl prey base and habitat availability. The importance of the pygmy-owl population in Arizona to the segment of the overall pygmy-owl population occupying Sonoran desertscrub and semi-desert grasslands will increase as habitat is converted in Mexico.

Under the current taxonomic classification, cactus ferruginous pygmy-owls also occur in southern Texas. However, recent genetic work (Proudfoot and Slack 2001) may indicate that the pygmy-owls in Texas are genetically distinct from the pygmy-owls in Arizona, possibly to the subspecies level. Regardless of the genetic distinction, pygmy-owls in Texas are found primarily on large private ranches where the levels of threat to habitat are reduced from those found in Arizona. Pygmy-owl populations in Texas are geographically separated from Arizona and currently provide no genetic or demographic support for Arizona populations.

Since listing in 1997, approximately 165 Federal agency actions have undergone informal consultation regarding the potential effects to pygmy-owls. These are actions that included sufficient measures to avoid or minimize impacts to the pygmy-owls so that the effects were insignificant or discountable. At least 49 Federal agency actions have undergone formal section 7 consultations throughout the pygmy-owl's range. Of these, only one resulted in a draft jeopardy opinion, and that was resolved as a non-jeopardy final opinion. Six formal consultations anticipated incidental take of one or more pygmy-owls. Given the extremely low number of known pygmy-owls in Arizona at present, lethal "take" of even a single owl would make it difficult to avoid jeopardizing the species. Many activities continue to adversely affect the distribution and extent of all types of pygmy-owl habitat throughout its range (development, urbanization, grazing, fire, recreation, native and non-native habitat removal, river crossings, ground and surface water extraction, etc.). Since 1997, we have provided technical assistance to hundreds of projects that do not have a federal nexus, primarily single-family residences. These actions have no legal requirement to follow the recommendations we provide under technical assistance and we have no way of monitoring if or to what extent the recommendations are incorporated. They may or may not contribute to the conservation of the pygmy-owl, but they certainly contribute to ongoing effects to pygmy-owl habitat. Stochastic events, such as fire, drought, and spikes in predator populations, also continue to adversely affect the distribution and extent of pygmy-owl habitat.

Anticipated or actual loss of occupied pygmy-owl habitat due to Federal or federally-permitted projects has resulted in biological opinions that have also led to acquisition of otherwise unprotected property specifically for conservation of the pygmy-owl.

ENVIRONMENTAL BASELINE

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

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 the BA, the applicant defined the action area as those areas of habitat below 4,000 feet that may be affected by construction and potential nesting sites within 1,310 feet of the proposed action that may be subject to noise disturbance during construction. In addition, the applicant is proposing a 7.08

mile buffer surrounding the project area to accommodate dispersing juvenile pygmy-owls. A pygmy-owl home range consists of 1,970 feet around the nest site or activity center, and we believe this is the distance that should be used to define the action area.

Pygmy-owl surveys were conducted by HEG in 2001 and 2002. No pygmy-owls were detected. No surveys were done in 2003, but surveys will be done in 2004. The only historical records of pygmy-owls within the Nogales District of the FS are in Sycamore Canyon and a dispersing juvenile in the Jarillas allotment. Pygmy-owl surveys were done in Sycamore Canyon in 1997 and 1998, and no owls were detected. In addition, the FS has surveyed 2,300 acres and found no pygmy-owls. A lone female pygmy-owl has been monitored in the Green Valley area in 2003 and 2004. This bird is being tracked by AGFD biologists. It is not known how close this pygmy-owl is to the action area.

Pygmy-owl habitat north of Sahuarita Road consists of Sonoran desertscrub, including scattered saguaros with potential nesting cavities. This area has the highest potential for pygmy-owl occupancy in the entire project area. Land status in this area is a mix of private and State land. The ASARCO Mission mine complex is also in this area. Grazing occurs on much of the State land.

Pygmy-owl habitat south of Sahuarita Road consists primarily of former semi-desert grassland that has been invaded by mesquite and acacia trees, mixed-cacti, ocotillo, yucca, and grasses, including the non-native Lehmann's lovegrass (*Eragrostis lehmanniana*). The area is largely undeveloped, but contains some existing electrical distribution lines and associated roads. There are also some low-density housing developments. Some areas of deciduous riparian forests are also found south of Arivaca Road in Sopori Wash and Peck Canyon. Land ownership in this area includes private, State, BLM, and FS.

An undetermined amount of undocumented immigrant (UDI) traffic occurs within the action area. Habitat damage is often associated with this, including discarded trash, illegal campfires, and disturbance near water sources. This type of activity is likely to remain the same or increase in the future.

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 or interdependent with that action 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.

Direct Effects

Pygmy-owls have been documented colliding with windows and fences in the Tucson area (U.S. Fish and Wildlife Service 2002). Pygmy-owls are capable flyers, but rarely make flights greater

than 100 feet (observational data from AGFD and FWS). Typical flight patterns are more likely to be from one tree to another, avoiding long flights in open areas, presumably to avoid exposure to predation (AGFD 2003). However, as opening size (i.e., gaps between trees or large shrubs) increases, coupled with increased threats (e.g., moderate to high traffic volumes and other human disturbances) relatively wide open areas may restrict pygmy-owl movement. The maximum size of the ROW will be 125 feet. Not all of the vegetation will be cleared from the ROW; only 12 feet is allowed for road construction.

Wide roadways and associated clear zones cause large gaps between tree canopies on either side of roadways, resulting in lower flight patterns over roads. This low flight level may result in pygmy-owls flying directly into the pathway of oncoming cars and trucks, significantly increasing the threat of pygmy-owls being struck. Measures can be implemented in roadway design to minimize these threats and allow successful movement across roadways. Among other measures, decreasing the canopy openings between trees on either side of roads and increasing the density of trees along roadways to provide greater shelter and cover from predators and human activities can be used to minimize adverse effects to pygmy-owls attempting to cross roads. Specific research is needed to determine the distance at which road and clear-zone widths significantly affect successful pygmy-owl movement, types of vegetation needed, roadway and landscaping designs, speed limits, etc.

There is potential for a pygmy-owl to be injured or killed in a collision with a construction vehicle. But, since there have been no pygmy-owls detected within the project area, it is unlikely that a collision would occur. Also, there will be existing vegetation on either side of the road since most of the surrounding area is undeveloped. This will reduce the chances of low-flying pygmy-owls as appropriate vegetation will be available on either side of the road.

There is a small risk of collision and electrocution with power lines, structures, and towers. To minimize the risk of powerline collisions, TEP will be following the guidelines outlined in "Suggested Practices for Raptor Protection on Power Lines: The State of the Art in 1996". To minimize the risk of electrocution, the distance between the power lines will be at least 18 feet. The average wingspan of an adult pygmy-owl is 15 inches; therefore there should be no risk of electrocution because there will no contact zone between pygmy-owl wings and the wires.

Short-term noise associated with construction activities, especially from the use of helicopters to install the transmission lines, could disturb pygmy-owls. These noises may also cause pygmy-owls to avoid using potential habitat in proximity to the action area. Since no pygmy-owls are known from the action area, direct effects from noise disturbance are expected to be minimal. The conservation measures outlined for pygmy-owl will provide additional protection if a pygmy-owl is detected during construction. Proposed critical habitat does not occur in the action area; thus none would be affected by the proposed action.

Indirect Effects

The proposed action will result in the disturbance of areas that support potential pygmy-owl habitat. The disturbance will be of a temporary nature, as most of the roads will be closed and restored, and all of the disturbed areas will be reseeded. The proposed action will result in the

temporary disturbance of 38.9 acres of Sonoran desertscrub, 36.7 acres of desert xeroriparian scrub, and 0.14 acre of deciduous riparian habitat. There will be a permanent loss of 4.9 acres of Sonoran desertscrub and 4.5 acres desert riparian scrub. Local disturbance to the pygmy-owl prey base will be minimized due to the linear nature of the project.

There will be the potential for increased use of pygmy-owl habitat by the public, due to the creation of new access points. Although TEP is proposing to use existing roads as much as possible, some new construction will take place. TEP will control access to the ROW on private lands and closure of the ROW on public lands will occur as needed. Unauthorized off-road vehicle use may occur and disturb any pygmy-owls in the area in the future. There is also an increased probability of human-caused ignitions in the action area. Suitable habitat may be destroyed. The measures outlined in the Fire Plan will minimize the risk of wildfire in the action area.

New disturbance and equipment can contribute to the spread of non-native species into a previously uninfected area. Some areas already support stands of Lehmann's lovegrass and additional disturbance can facilitate its spread into other areas. This is also the case for buffelgrass. Both of these invasive grass species have the potential to alter the ecosystem of the plant community by forming monotypic stands that do not allow for the regeneration of native species and create a much heavier fuel load with higher fire intensities. This change in plant composition can lead to a permanent change in the plant community by allowing fires to burn hotter and more frequently than would occur in the natural vegetation. Species like saguaros, which are not fire-adapted, can be removed from the plant community. Saguaros provide nesting substrate for pygmy-owls and their loss can represent an adverse effect. Measures outlined in the Invasive Species Management Plan will minimize the introduction or spread of invasive species in the action area.

CUMULATIVE EFECTS

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

The amount of development within the action area that may occur in the future is unknown. Pima County grew by 26.5 percent between 1990 and 2000. It seems likely that this growth will continue, especially near the areas of Tucson and Sahuarita. Areas in Pima County within the action area, where the majority of pygmy-owl potential habitat is located, are a mix of private and State lands. All of these lands could become available for development in the future. This would mean continued loss of pygmy-owl habitat and further fragmentation of habitat and dispersal corridors for the owls.

Lands in Santa Cruz County are primarily on Forest Service lands. Actions on the Forest would be subject to our review under section 7 of the ESA and are not considered cumulative to this proposed action. As discussed in the Environmental Baseline, illegal smuggling and UDIs in the

action area cause environmental damage that may adversely affect pygmy-owls and their habitat. The effects of these illegal activities are cumulative effects.

Conclusion

After reviewing the current status of the pygmy-owl, the environmental baseline for the action area, the effects of the proposed transmission line, and cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the pygmy-owl. This project does not occur within proposed critical habitat for the pygmy-owl, thus none will be affected. In making our determination we considered the following:

- The status of the pygmy-owl in Arizona is tenuous. The number of adult pygmy-owls documented in Arizona has never exceeded 50 since regular survey and monitoring work began in 1993. In both 2002 and 2003, the number of known pygmy-owl nests in the State was three and four respectively, down from the highest number, 13, documented in 2001. Although the sample size is low and the monitoring period short, there appears to be a declining trend in the population that has somewhat corresponded with recent drought conditions.

- Surveys in the action area (2001 and 2002) have detected no pygmy-owls. There is one female pygmy-owl in the vicinity, but her location in proximity to the action area is unknown. Suitable habitat exists within the action area, but the majority of the disturbance will be temporary in nature. A total of 85.1 acres of suitable habitat will be altered, but only 9.4 acres (11 percent) will be permanently cleared within the ROW.

- Cumulative effects considered in our analysis include effects from illegal smuggling and UDI activity and the likelihood of residential subdivisions, single-family residences, and commercial projects where zoning, development plans, subdivision plats, or impact fee assessment make them reasonably certain to occur, but no Federal nexus and associated section 7 review are anticipated. Areas where these cumulative effects are anticipated to occur include areas where pygmy-owls have been documented and in habitat suitable for pygmy-owl dispersal. Cumulative effects are likely to contribute to habitat fragmentation and degradation. We are not aware of site-specific development plans within the action area.

- The Applicant has included a number of conservation measures that will meaningfully reduce the effects of the proposed action on pygmy-owls.

In summary, our conclusions are based on the record of this consultation, including the BA, supplements to the BA, correspondence, meetings with the Applicant, the information outlined in this BO, and the following:

- Surveys completed up to this date have detected no pygmy-owls within the project area; therefore, the likelihood of incidental take is minimal.

- Two years of consecutive surveys will be completed prior to construction. If surveys are not completed no construction will take place during the breeding season. If a pygmy-owl is detected during construction, TEP will follow the conservation measures outlined in the proposed action.

- The project will disturb 38.9 acres of Sonoran desertscrub, 36.7 acres of desert riparian vegetation, and 0.14 acre of deciduous riparian vegetation. All of this disturbance will be of a temporary nature as TEP will reseed, close, and rehabilitate roads after construction is completed. A total of 9.4 acres will be permanently cleared of vegetation. TEP will also transplant saguaros that cannot be avoided during construction.

- Plans will be in place to address indirect effects from increased wildfire risk and the potential spread and introduction of invasive species.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation 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. "Harm" is defined (50 CFR Sect. 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 Sect. 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 behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.

Under the terms of sections 7(b)(4) and 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.

Amount or Extent of Take Anticipated

We do not anticipate that the proposed action will result in incidental take of any pygmy-owls.

CONSERVATION RECOMMENDATIONS

Sections 2(c) and 7(a) (1) of the Act direct Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendations provided here do not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a) (1) responsibilities for the pygmy-owl. In furtherance of the purposes of the Act, we recommend implementing the following discretionary actions:

- Conduct or fund studies using both monitoring and telemetry to determine habitat use patterns in that portion of the action area suitable for pygmy-owls. Surveys involving simulated or recorded calls of pygmy-owls require an appropriate permit from us. AGFD should also be contacted in regard to State permitting requirements.

- Assist in the implementation of recovery tasks identified in the pygmy-owl Recovery Plan, when approved by FWS.

- Monitor the effectiveness of conservation measures associated with this proposed action, especially road closures and the potential for increased off-road vehicle use in the action area.

Lesser long-nosed bat
Status of the Species

We listed the lesser long-nosed bat (originally, as *Leptonycteris sanborni*; Sanborn's long-nosed bat) as endangered on September 30, 1988 (53 FR 38456). Critical habitat has not been designated for this species.

The lesser long-nosed bat is one of four members of the tropical bat family *Phyllostomidae*, which are found in the United States. It was formally separated from the Mexican long-nosed bat *(L. nivalis)* as a distinct species *(L. sanborni)* by Hoffmeister (1986). It has a long muzzle, a long tongue, and is capable of hover flight. These features are adaptations that allow the bat to feed on nectar from the flowers of columnar cacti such as the saguaro and organ pipe cactus, and from paniculate agaves such as Palmer's agave *(Agave palmeri)* and Parry's agave *(A. parryi)*.

The lesser long-nosed bat is a medium-sized bat with a forearm measuring 2.0-2.2 inches and weighing 0.7-0.9 ounces as an adult. Adult fur is grayish to reddish-brown; juveniles have gray fur. Its elongated rostrum bears a small, triangular noseleaf, its ears are relatively small and simple in structure, and it has a minute tail. It is generally smaller in external and cranial measurements than *L. nivalis*. *Leptonycteris curasoae* can be distinguished from the Mexican long-tongued bat (*Choeronycteris mexicana)*, with which it co-occurs in Arizona, by the larger size, less elongated snout, and tiny tail.

The lesser long-nosed bat is migratory and found throughout its historical range, from southern Arizona and extreme southwestern New Mexico, through western Mexico, and south to El Salvador. In southern Arizona lesser long-nosed bat roosts have been found from the Picacho Mountains (Pinal County) southwest to the Agua Dulce Mountains (Pima County), southeast to the Chiricahua Mountains (Cochise County) and south to the international boundary. Individuals have also been observed from the vicinity of the Pinaleno Mountains (Graham County) and as far north as the McDowell Mountains (Maricopa County) (AGFD 1999). This bat is also known from far southwestern New Mexico in the Animas and Peloncillo Mountains (Hidalgo County). It is a seasonal resident in Arizona, usually arriving in early April and leaving in mid-September to early October. It resides in New Mexico only from mid-July to early September (Hoyt *et al*. 1994).

Roosts in Arizona are typically occupied from late April to October (Cockrum and Petryszyn 1991, Sidner 1997). In spring, adult females, most of which are pregnant, arrive in Arizona and gather into maternity colonies in southwestern Arizona. These roosts are typically at low elevations near concentrations of flowering columnar cacti. Litter size is one. After the young are weaned these colonies disband in July and August; some females and young move to higher elevations, ranging up to more than 6,000 feet, primarily in the southeastern parts of Arizona near concentrations of blooming paniculate agaves. Actual dates of these seasonal movements are rather variable from one year to the next (Cockrum and Petryszyn 1991, Fleming *et al*. 1993). Adult males typically occupy separate roosts forming bachelor colonies. Males are known mostly from the Chiricahua Mountains, but also occur with adult females and young of the year at maternity sites (Fish and Wildlife Service 1997b). Throughout the night between foraging bouts both sexes will rest in temporary night roosts.

The lesser long-nosed bat consumes nectar and pollen of paniculate agave flowers and the nectar, pollen, and fruit produced by a variety of columnar cacti. In Arizona, four species of agave and two cacti are the main food plants (Wilson 1985). The agaves include Palmer's agave, Parry's agave, desert agave *(A. deserti)*, and amole *(A. schotti)*. Amole is considered to be an incidental food source. The cacti include saguaro and organ pipe cactus. Nectar of these cacti and agaves are high-energy foods. Concentrations of food resources appear to be patchily distributed on the landscape and the nectar of each forage plant species is only seasonally available. Cacti flowers and fruit are available during the spring and early summer; blooming agaves are available through the summer, primarily from July through early October, though Parry's agave blooms earlier. Columnar cacti occur in lower elevation areas of the Sonoran Desert region, and paniculate agaves are found primarily in higher elevation desertscrub areas, desert grasslands and shrublands, and into the mountains. Parry's agave is usually found at higher elevations than Palmer's agave (Gentry 1982). The bats are generally considered to time their movement and feeding to the progression of flowering associated with these cacti and agaves. Many species of columnar cacti and agaves appear to provide a "nectar corridor" for lesser long-nosed bats as they migrate in spring from Central America and Mexico to as far north as southern Arizona, through fall when they return south (Gentry 1982, Flemming *et al*. 1993, Slauson *et al*. 1998). Lesser long-nosed bats appear to be opportunistic foragers and efficient fliers, capable of flight speeds up to 14 miles per hour (Sahley *et al*. 1993). They often forage in flocks. Seasonally available food resources may account for the seasonal movement patterns of the bat.

The lesser long-nosed bat is known to fly long distances from roost sites to foraging sites. Night flights from maternity colonies to flowering columnar cacti have been documented in Arizona at 15 miles and in Mexico at 25 miles and 38 miles (one way) (Dalton *et al*. 1994, V. Dalton, pers. comm., Y. Petryszyn, University of Arizona, pers. comm.). A substantial portion of the lesser long-nosed bats at the Pinacate Cave in Sonora (a maternity colony) fly 25-31 miles each night to foraging areas in Organ Pipe Cactus National Monument (Fish and Wildlife Service 1997b). Horner *et al*. (1990) found that lesser long-nosed bats commuted 30-36 miles round trip between an island maternity roost and the mainland in Sonora; the authors suggested these bats regularly flew at least 50-62.5 miles each night. In southeastern Arizona, lesser long-nosed bats commuted up to 17.4 miles, and an average of 11.7 miles, from the roost to core foraging areas (Steidl and Ober 2003, Ober and Steidl 2004). Lesser long-nosed bats have been observed feeding at hummingbird feeders many miles from the closest potential roost site (Petryszyn, pers. comm.).

Suitable day roosts and suitable concentrations of food plants are the two resources that are crucial for the lesser long-nosed bat (Fish and Wildlife Service 1997b). Caves and mines are used as day roosts. The factors that make roost sites useable have not yet been identified. Whatever the factors are that determine selection of roost locations; the species seems sensitive to human disturbance. Instances are known where a single brief visit to an occupied roost is sufficient to cause a high proportion of lesser long-nosed bats to temporarily abandon their day roost and move to another. Perhaps most disturbed bats return to their preferred roost in a few days. However, this sensitivity suggests that the presence of alternate roost sites may be critical when disturbance occurs. Interspecific interactions with other bat species may also influence lesser long-nosed bat roost requirements.

Food requirements of the lesser long-nosed bat are very specific. Adequate numbers of flowers or fruits are required within foraging range of day roosts and along migration routes to support large numbers of this bat. Locations of good feeding sites play an important role in determining availability of potential roosting sites, and roost/food requirements must be considered jointly when discussing the habitat requirements of this bat. A suitable day roost is probably the most important habitat requirement, but potentially suitable roosts must be within reasonable foraging distances of sufficient amounts of required foods before this bat will use them. It seems evident that the lesser long-nosed bat forages over wide areas and that large roosts require extensive stands of cacti or agaves for food. Therefore, destruction of food plants many miles from a roost could have an adverse effect on this bat (Fish and Wildlife Service 1997b).

The lesser long-nosed bat recovery plan (Fish and Wildlife Service 1997b) identifies the need to protect foraging areas and food plants. Columnar cacti and agaves provide critical food resources for this bat. Populations of these plants need continued protection to sustain nectar-feeding bat populations. A critical need in this area is information about the size of the foraging areas around roosts so that adequate areas can be protected. This information will show the minimum area needed to support a roost of nectar- and fruit-eating bats, provided the roost locations are known. There are 16 major roost sites in Arizona and Mexico (Fish and Wildlife Service 1997b).

According to surveys conducted in 1992 and 1993, the number of bats estimated to occupy these sites was greater than 200,000. Twelve major maternity roost sites are known from Arizona and Mexico. According to the same surveys, the maternity roosts are occupied by a total of more than 150,000 lesser long-nosed bats. The numbers above indicate that, although many of these bats are known to exist, the relative number of known large roosts is small. Disturbance of these roosts and the food plants associated with them could lead to the loss of the roosts. Limited numbers of maternity roosts may be the critical factor in the survival of this species.

ENVIRONMENTAL BASELINE

In the BA, the applicant defined the action area to encompass all of the suitable foraging and roosting habitat within a 40-mile buffer surrounding the proposed transmission corridor. Lesser long-nosed bats have been documented to forage up to 40 miles from their roost site. Potential

roosting habitat occurs on FS lands and also along the proposed route in areas that contain saguaros and agaves.

Leptonycteris bats require suitable forage plants (paniculate agaves and columnar cacti) and suitable roost sites. Mines and caves occurring in southern and central Arizona provide suitable sites for post-maternity roosts of the lesser long-nosed bat. There are two known roost sites within the action area. There are a few small caves and crevices that may be suitable sites for day roosts. There are unsurveyed caves and mine adits on the FS that may support roosts. The two closest roost sites are Cave of the Bells in the Santa Rita Mountains (approximately 20 miles to the west) and a cave in the Patagonia Mountains (approximately 35 miles to the west). These roosts are within 40 miles of the proposed route, and habitat exists between the roosts and the proposed route that may be used by the bats. Agaves, and to a lesser extent, saguaros, are found in varying densities and age classes within the action area. They are found within the broad vegetation community classification of desertscrub, desert grassland, interior chaparral, oak woodland, pinyon-juniper woodland, pine-oak woodland, and mixed conifer in areas of the FS and other areas in the region. The primary agave used by the bat is Palmer's agave, which, as estimated by the FS, is widely scattered over 1,000,000 acres at densities of 10-200 per acre, generally between the elevations of 3,000-6,000 feet. Parry's agave is found between 5,000-8,200 feet and begins blooming in mid-spring. Both species occur within the action area.

Considerable evidence exists suggesting a dependence of *Leptonycteris* on certain agaves and cacti, although some Palmer's agave has been shown not to be dependent on *Leptonycteris* for pollination (Slauson 1996 and 1999, Slauson and Dalton 1998). Activities that adversely affect the density and productivity of columnar cacti and paniculate agaves may adversely affect populations of lesser long-nosed bats (Abouhalder 1992, Fish and Wildlife Service 1997b). Excess harvest of agaves in Mexico, collection of cacti in the United States, and conversion of habitat due to urban expansion, agricultural uses, livestock grazing, and other development may contribute to the decline of long-nosed bat populations (Fish and Wildlife Service 1988a). The northern portion of the proposed route is primarily undeveloped but contains some existing electrical lines as well as low-density housing near Sahuarita Road. There is one large mining operation, the Mission Mine Complex, that is also located within the action areas. State lands are used primarily for grazing. Lands on the FS are also used for livestock grazing. The route passes through several FS allotments. All of the livestock activities on the FS have been through section 7 consultation (2-21-98-F-399-R1).

An undetermined amount of undocumented immigrant (UDI) traffic occurs within the action area. Habitat damage is often associated with this, including discarded trash, illegal campfires, and disturbance near water sources. This type of activity is likely to remain the same or increase in the future.

EFFECTS OF THE ACTION

Direct Effects

If bats are present in an undetected roost within the project area, it is possible they may be disturbed by loud noises associated with construction, especially when helicopters are installing

the transmission lines. This will depend on the proximity of the roost to the construction zone. It is anticipated that as long as the roost sites themselves are not disturbed, it is unlikely that bats will abandon a roost because of an outside noise. As stated, there are no known roosts in close proximity to the proposed route, and the two known roosts are far enough away to not be affected by noise. Small numbers of bats may be temporarily displaced from small day roosts, but they can fly to another temporary roost in the area.

Indirect Effects

There will be loss of foraging plants due to construction. The severity of adverse effects to *Leptonycteris* bats resulting from potential reduction in forage resources is dependent on the importance of forage plants in a specific area to reproduction, survival, and growth of the bat. The primary food source for the lesser long-nosed bat in southeastern Arizona from mid-summer through fall are Palmer's and Parry's agave. Both species occur in varying densities within the action area. Saguaros may be used, but they have usually finished flowering by the time lesser long-nosed bats arrive in southeastern Arizona. Saguaros usually bloom in May and the bats normally arrive in July-August.

It is not known how many individual agave or saguaros plants will be lost through the creation of new roads and clearing of sites for tower placement. The total amount of disturbance is relatively small due to the linear nature of this project. All agaves and saguaros will be transplanted outside of the construction zone. It is anticipated that the effect to the foraging habitat from the proposed action will be minimal as there will be intact areas of potential foraging habitat on either side of the proposed ROW. The mobility of the bats, coupled with the patchy distribution of foraging resources across the landscape, will reduce the overall effects of construction.

All of the other indirect effects (wildfire, invasive species, increased access) were addressed in the pygmy-owl effects section and are minimized by the same proposed conservation measures that were discussed in that section.

CUMULATIVE EFFECTS

The cumulative effects are the same as those discussed in the pygmy-owl section.

Conclusion

After reviewing the current status of the lesser long-nosed bat, the environmental baseline for the action area, the effects of the proposed transmission line, and cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the lesser long-nosed bat. In making our determination we considered the following:

- There are at least 16 major roost sites in Arizona. The number of bats fluctuates from year to year. The bats arrival in southeastern Arizona is usually timed with the blooming of paniculate agaves (*Agave palmeri* and *A. parryi*). They also feed on saguaro blooms, particularly in the southwestern deserts, when their arrival in Arizona, from Mexico,

coincides with saguaro flowering. Limiting factors for the bat are most likely the number of roost sites, disturbance of roost sites, and destruction of habitat that supports their food base. There are no current estimates of the population size.

- The cumulative effects discussed for the action area include residential development and continued degradation of habitat from undocumented aliens from Mexico. Many of these subdivisions will not require section 7 consultation because of a lack of Federal nexus. There will be continued fragmentation of habitat and loss of foraging plants.

- Potential direct adverse effects to the species are expected to be discountable (i.e., extremely unlikely to occur), as no roosts occur within the project area.

- There are no known roost sites adjacent to the proposed route. The nearest roost sites are 20 and 35 miles to the west of the project area and will not be affected by construction noise associated with the proposed action. Both roost sites are on Federal land, with some protections in place.

- Some foraging plants will be lost through construction activities. Agaves and saguaros will be transplanted to areas outside of the ROW to minimize the effects from the proposed action. In addition, due to the linear nature of this project, large areas of potential foraging habitat will be available within the action area.

- Plans will be in place to address indirect effects from increased wildfire risk and the potential spread and introduction of invasive species that may affect potential foraging habitat of the bat.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation 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. "Harm" is defined (50 CFR Sect. 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 Sect. 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 behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering. "Incidental take" is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity.

Under the terms of sections 7(b)(4) and 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.

Amount or Extent of Take Anticipated

We do not anticipate that the proposed action will result in incidental take of any lesser long-nosed bats.

CONSERVATION RECOMMENDATIONS

Sections 2(c) and 7(a) (1) of the Act direct Federal agencies to use their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of listed species. Conservation recommendations are discretionary agency activities to minimize or avoid effects of a proposed action on listed species or critical habitat, to help implement recovery plans, or to develop information on listed species. The recommendations provided here do not necessarily represent complete fulfillment of the agency's section 2(c) or 7(a) (1) responsibilities for the lesser long-nosed bats. In furtherance of the purposes of the Act, we recommend implementing the following discretionary actions:

- Survey suitable roost habitat within the action area.
- Monitor the effectiveness of the saguaro and agave transplant efforts.
- Provide funding to bat researchers and/or the FS to continue monitoring efforts at the two known lesser long-nosed bat roosts within the action area.

Pima pineapple cactus
STATUS OF THE SPECIES

Life History

The final rule listing Pima pineapple cactus as endangered was published on September 23, 1993 (58 FR 49875). The rule became effective on October 25, 1993; no critical habitat has been designated. Factors that contributed to the listing include habitat loss and degradation, habitat modification and fragmentation, limited geographic distribution and plant species rareness, illegal collection, and difficulties in protecting areas large enough to maintain functioning populations. The biological information below is summarized from the proposed and final rules, and other sources.

Pima pineapple cactus is a low-growing hemispherical cactus with adults varying in stem diameter from 2.0-8.3 inches and height from 1.8-18.0 inches. Individuals are considered adults when they reproduce sexually. Plants can be either single or multi-stemmed with yellow flowers blooming with the summer rains. Clusters of Pima pineapple cactus stems are formed primarily from vegetative clones produced at the plant base (Benson 1982, Roller 1996). The diagnostic field character of this taxon is the presence of one stout, straw-colored, hooked central spine. Radial spines extend laterally around the central spine and average 10 to 15 spines on large cacti and six on small cacti (Benson 1982).

Pima pineapple cactus occurs south of Tucson, in Pima and Santa Cruz counties, Arizona and adjacent northern Sonora, Mexico. It is distributed at very low densities throughout both the Altar and Santa Cruz valleys, and in low-lying areas connecting the two valleys.

Groups of flowers begin to bloom for single day periods five to seven days after the first monsoon rains. Flowering is triggered by as little as 0.12 inches of precipitation. Generally flowers begin opening midmorning and close at dusk (Roller 1996). Adult plants bloom one to three days each year; flowering is usually over by the end of August. Cross-pollination produces significantly more viable seeds than self-pollination. Fruits are mature within two weeks following successful pollination. Germination has been observed in the field during the summer monsoon rainy season (Roller 1996). Anecdotal observations indicate the species' flowers are visited by a variety of native bees and European honey bees, which have been observed to leave the flowers with their forehead and hind legs covered in Pima pineapple cactus pollen.

Habitat fragmentation and isolation may be an important factor limiting future seed set of this cactus. Recent data show that the species cannot successfully self pollinate *in situ* and is reliant on invertebrate pollinators. One hypothesis is that the spatial distribution pattern of individual Pima pineapple cacti within a given area may regulate pollinator visitations, thus resulting in more successful cross-pollination and subsequent seed set over the population (Roller 1996). If the pollinators are small insects with limited ability to fly over large distances, habitat fragmentation may contribute to a decrease in pollinator effectiveness with a subsequent decrease in seed set and recruitment.

Population Stability

Extrapolations from recent (1992-1997) surveys of known Pima pineapple cactus locations suggest that the cactus may be more numerous than previously thought. Projections based only on known individuals may underestimate the total number of individuals. This in no way indicates that the cactus is not rare or endangered. Pima pineapple cactus is widely dispersed in very small clusters across land areas well suited for residential, commercial, or mining development. Field observations suggest a great deal of land area within the range boundaries would not support Pima pineapple cactus today due to historical human impacts. Thus, populations are already considerably isolated from each other in many portions of the range, and population size and apparent recruitment varies significantly across the range. On a more local scale, population variability may relate to habitat development, modification, and/or other environmental factors such as slope, vegetation, pollinators, dispersal mechanisms, etc.

The transitional zone between the two regions of vegetation described by Brown (1982) as semidesert grassland and Sonoran desertscrub contains denser populations, better recruitment, and individuals exhibiting greater plant vigor. Vegetation within this transition zone is dominated by mid-sized mesquite trees, half shrubs (snakeweed, burroweed, and desert zinnia), and patches of native grass and scattered succulents. Because populations are healthier in this transitional zone, conservation within these areas is very important (Roller and Halvorson 1997). However, this important habitat type is not uniformly distributed throughout the plant's range. Populations of Pima pineapple cacti are patchy, widely dispersed, and highly variable in density. The higher population densities have only been documented at three sites. Compared to other

surveys, two of these sites are very small in scale and range from 1-3 plants per acre. Other densities across the majority of the plant's range vary between one plant per 4.6 acres and one plant per 21 acres (Mills 1991, Ecosphere 1992, Roller 1996).

Land areas surrounding developed parts of Green Valley and Sahuarita, Arizona, (including adjacent areas of the San Xavier District of the Tohono O'odham Nation) may be important for the conservation of this species within its range. Analysis of surveys conducted from 1992 to 1995 with a multivariate statistical analysis documented a pattern of greater population densities, higher ranks of cactus vigor, and better reproduction occurring within the transitional vegetation type found in this area of the northern Santa Cruz Valley (Roller and Halvorson 1997). This area could be defined as an ecotone boundary between semidesert grassland and Sonoran desertscrub.

Seedling and sub-adult size classes are uncommon in documented populations across the plant's range. However, this may be a function of the difficulty of finding such small, well-camouflaged plants in a large-scale survey, or because the establishment phase of the seedling may be limited in some unknown way. Research on Pima pineapple cactus reproduction has suggested that the establishment phase of Pima pineapple cactus life history may limit recruitment within populations (Roller 1996). Evidence presented to support this conclusion was the abundance of flowers, fruits, and viable seed, and the rarity of seedling presence at different sites spread throughout the plant's range (Roller 1996). Other research has confirmed that the establishment phase of other Sonoran cacti species may be critical for survival to reproductive maturity (Steenbergh and Lowe 1977).

Status and Distribution

Generally, the Pima pineapple cactus grows on gentle slopes of less than 10 percent and along the tops (upland areas) of alluvial bajadas nearest to the basins coming down from steep rocky slopes. The plant is found at elevations between 2,360 and 4,700 feet. (Phillips *et al.* 1981, Benson 1982, Ecosphere 1992), in vegetation characterized as either or a combination of both the Arizona upland of the Sonoran desertscrub and semidesert grasslands (Brown 1982).

The acquisition of baseline information began with surveys documenting the presence of Pima pineapple cactus as early as 1935. More intensive surveys were initiated in 1991 and other research established in 1993 further investigated the reproductive biology, distribution, fire effects, and mortality associated with various threats. Therefore, the best available baseline information is relatively recent and may not represent actual changes in distribution since the decline in the status of the species began.

Widely scattered surveys have been conducted across sites that varied considerably in cacti density. Pima pineapple cactus occurs in 50 townships within its U.S. range. However, a considerable amount of land area within the range boundaries does not provide habitat for the species due to elevation, topography, hydrology, plant community type, and human degradation. To date, an estimated 56,730 acres, or 10 to 20 percent of the U.S. range, have been surveyed. Not all of this area has been intensively surveyed; some has only been partially surveyed using small land blocks to estimate densities rather than 100 percent ground surveys. A conservative

estimate of total cacti located to date would be 3,800 individuals. The majority of those were located after 1991.

It is important to clarify that the above number represents the total number of cacti found and not the current population size. It would be impossible to estimate densities over the remaining unsurveyed area because of the clumped and widely dispersed pattern of distribution of this species. Of the 3,800 individuals recorded to date, 2,203 (58 percent) have been removed. This quantity includes observed and authorized mortalities (e.g. as a result of urban development) and individuals transplanted since the species was listed in 1993. A small portion of these mortalities were caused by natural factors (i.e., drought). Moreover, this figure does not take into account those cacti that are removed from private land or lost to other projects that have not undergone section 7 reviews.

Transplanted individuals are not considered as functioning within the context of a self-sustaining population. Efforts to transplant individual cacti to other locations have only had limited success and the mortality rate has been high, especially after the first year. Furthermore, once individuals are transplanted from a site, it is considered to be extirpated as those individuals functioning in that habitat are irretrievably lost. We view transplanting cacti as a measure of last resort for conserving the species. Transplanting will be recommended only when on-site and off-site habitat conservation is not possible and the death of cacti is unavoidable.

The area of habitat reviewed under section 7 of the ESA between 1987 and 2000 (i.e., habitat developed or significantly modified beyond the point where restoration would be a likely alternative) is approximately 24,429 acres, which represents 43 percent of the total area surveyed to date. In 1998, more than 1,100 acres of Pima pineapple cactus habitat were lost including 353 acres from the Las Campanas Housing Development project, and 752 acres from the ASARCO, Inc. Mission complex project. In 2000, 586 acres of habitat were lost with the expansion of a state prison in Tucson. In 2001, 177 acres of habitat were lost through development, but 888 acres of occupied and suitable habitat were conserved through conservation easements. In 2002, 383 acres of Pima pineapple cactus habitat were destroyed for development, but 36 acres were protected in the conservation bank and an additional 258 acres of habitat were conserved in private conservation easements. In 2003, one subdivision resulted in the loss of 858 acres of suitable Pima pineapple cactus habitat and set aside 784 acres of occupied habitat in a conservation easement. We are aware of housing developments along Valencia Road, Pima County, Arizona, in the vicinity of T15S, R12E, Section 15 and surrounding areas that support Pima pineapple cactus. These developments affect several hundred acres of habitat and have not been evaluated through the section 7 process. The number of acres lost through private actions, not subject to Federal jurisdiction, is not known, but given the rate of urban development in Pima County, we believe it is significant.

Most of the documented habitat loss has occurred south of Tucson down through the Santa Cruz Valley to the town of Amado. This area is critical for the future recovery of the species. The expansion of urban centers, human population, and mining activities will continue to eliminate habitat and individuals, and result in habitat fragmentation.

The protection of habitat and individuals is complicated by the varying land ownership within the range of this species. An estimated 10 percent of the potential habitat for Pima pineapple cactus is held in Federal ownership. The remaining 90 percent is on Tribal, State, and private lands. Most of the federally-owned land is either at the edge of the plant's range or in scattered parcels. The largest contiguous piece of federally-owned land is the Buenos Aires National Wildlife Refuge, located at the southwestern edge of the plant's range at higher elevations and lower plant densities.

Based on surveys and habitat analysis, areas south of Tucson through the Santa Cruz Valley to the town of Amado and surrounding developed parts of Green Valley and Sahuarita, and parts of the San Xavier District of the Tohono O'odham Nation, appear to support abundant populations, some recruitment, and units of extensive habitat still remain. However, the primary threat to the status of this species throughout its range is the accelerated rate (i.e., since 1993) at which this prime habitat is being developed, fragmented, or modified.

The Arizona Native Plant Law may delay vegetation clearing on private property for the salvage of specific plant species within a 30-day period. Although the Arizona State Native Plant Law prohibits the illegal taking of this species on state and private lands without a permit for educational or research purposes, it does not provide for protection of plants *in situ* through restrictions on development activities.

Based on current knowledge, urbanization, farm and crop development, and exotic species invasion alter the landscape in a manner that would be nearly irreversible in terms of supporting Pima pineapple cactus populations. Prescribed fire can have a negative effect if not planned properly.

Other specific threats that have been previously documented (U.S. Fish and Wildlife Service 1993), such as overgrazing and mining, have not yet been analyzed to determine the extent of effects to this species. However, partial information exists. Mining has resulted in the loss of hundreds, if not thousands, of acres of potential habitat throughout the range of the plant. Much of the mining activity has been occurring in the Green Valley area, which is the center of the plant's distribution and the area known to support the highest densities of individuals. Overgrazing by livestock, illegal plant collection, and fire-related interactions involving exotic Lehmann lovegrass may also negatively affect Pima pineapple cactus populations (U.S. Fish and Wildlife Service 1993).

Even with complete data on historical change related to Pima pineapple cactus distribution and abundance, we cannot reliably predict population status due to compounding factors such as climate change, urbanization, and legal and political complexities (McPherson 1995). We do not know if the majority of populations of Pima pineapple cactus can be sustainable under current reduced and fragmented conditions. Thus, there is a need to gather information on limits to the plant's distribution under current habitat conditions.

In summary, monitoring has shown that the range-wide status of the Pima pineapple cactus appears to have been recently affected by threats that have completely altered or considerably modified more than a third of the species' surveyed habitat, and have caused the elimination of

nearly 60 percent of documented locations. Dispersed, patchy clusters of individuals are becoming increasingly isolated as urban development, mining, and other commercial activities continue to detrimentally impact the habitat. The remaining habitat also is subject to degradation or modification from current land management practices, increased recreational use when adjacent to urban expansion (i.e., off-road vehicle use and illegal collection), and the continuing aggressive spread of nonnative grasses into habitat. Habitat fragmentation and degradation will likely continue into the foreseeable future based on historical data and growth projections produced by the Pima County Association of Governments (1996). There is very little Federal oversight on conservation measures that would protect or recover the majority of the potential habitat. Even some areas that have been the subject of section 7 consultations have been modified and may not be able to support viable populations of the Pima pineapple cactus over the long-term.

ENVIRONMENTAL BASELINE

The action area includes all potential habitat within the proposed ROW and a distance of 0.25 mile surrounding the proposed action. The 0.25 mile buffer encompasses the area that might be indirectly affected by the proposed action (e.g. the area that may be affected by the spread of a invasive grass). Pima pineapple cacti are known to occur in areas adjacent to the proposed route. Surveys were conducted along the entire 125 feet ROW in July 2002 and March 2003. A total of 52 Pima pineapple cacti were found within the ROW.

The northern portion of the proposed route is primarily undeveloped but contains some existing electrical lines as well as low-density housing near Sahuarita Road. There is one large mining operation, the Mission Mine Complex, that is also located adjacent to the action area. State lands are used primarily for grazing. Lands on the FS are also used for livestock grazing and the route passes through several FS allotments. All of the livestock activities on the FS have been through section 7 consultation (2-21-98-F-399-R1).

An undetermined amount of undocumented immigrant (UDI) traffic occurs within the action area. Habitat damage is often associated with this, including discarded trash, illegal campfires, and disturbance near water sources. This type of activity is likely to remain the same or increase in the future.

EFFECTS OF THE PROPOSED ACTION

Direct Effects

The proposed action will not result in the loss of any of the known Pima pineapple cactus within the ROW. The exact placement of the structures and new roads can be modified to avoid direct impacts to individual Pima pineapple cactus. All of the Pima pineapple cactus near construction areas and along main access routes will be clearly marked and protected to avoid impacts.

Indirect Effects

Occupied and suitable Pima pineapple cactus habitat will be lost or modified due to construction activities. Areas of permanent disturbance will remove portions of the seed bank, and areas of temporary disturbance can also alter the seed bank. In addition, the complete removal of vegetation will change water infiltration, compact soil, and change local site conditions. Although some areas of temporary disturbance may recover, it may take many years before full recovery is achieved. Sometimes Pima pineapple cactus can be found in areas of recent disturbance, as competition with other plants for nutrients and light are reduced.

To calculate the amount of disturbance to Pima pineapple cactus habitat, the entire alignment was divided into habitat classes based upon Pima pineapple cactus density. Areas that were over 15 percent slope, washes, and areas already disturbed were eliminated as potential Pima pineapple cactus habitat. The following habitat classes were used: Class A = > 0.3 Pima pineapple cactus/acre; Class B = 0.1 – 0.3 Pima pineapple cactus/acre; Class C = 0* - 0.09 Pima pineapple cactus/acre. Density was used as a surrogate for habitat quality; the higher the density of Pima pineapple cactus, the higher the quality of the habitat. The 0* value indicates an area that supported no pineapple cactus, but pineapple cactus were found in the vicinity of the ROW. The amount of permanent disturbance from access roads and pole locations was calculated for each habitat class. Acres lost in Class A will be compensated for at a 3:1 ratio, acres lost in Class B at a 2:1 ratio, and acres lost in Class C at a 1:1 ratio. The applicant will offset the loss of 28.9 acres of Pima pineapple cactus habitat by purchasing 36.5 credits (thereby protecting 36.5 acres of Pima pineapple cactus habitat) in a FWS-approved conservation bank for Pima pineapple cactus in the Altar Valley. The bank provides protection in perpetuity for the cactus and its habitat and the bank contributes to the overall recovery and conservation of the species.

Areas surrounding the northern portion of the proposed alignment, where the majority of Pima pineapple cacti were detected, are fairly inaccessible by vehicles and people. New permanent roads may allow for access into areas that were not available before. Pima pineapple cactus can be affected by off-road vehicle use, which modifies habitat and results in the destruction of cacti. We have observed Pima pineapple cactus that have been run over by off-highway vehicles. The majority of the ROWs in the northern portions will be within existing roads, with very little new road construction.

All of the other indirect effects (wildfire, invasive species, increased access) were addressed in the pygmy-owl effects section and are minimized by the same proposed conservation measures that were discussed in that section.

CUMULATIVE EFFECTS

The cumulative effects are the same as those discussed in the pygmy-owl section.

CONCLUSION

After reviewing the current status of Pima pineapple cactus, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is our biological

opinion that the proposed action is not likely to jeopardize the continued existence of the Pima pineapple cactus. No critical habitat has been designated, therefore, none will be affected. We base this conclusion on the following:

- The status of Pima pineapple cactus continues to degrade. We estimate that almost one-half of the known population has been destroyed; the result of urban development. New populations of Pima pineapple cactus, detected during project surveys, do not contribute to the overall population estimate because the cacti are often transplanted, resulting in death. Habitat continues to be developed and habitat loss and fragmentation remain significant threats for this species.

- Cumulative effects considered in our analysis include effects of illegal smuggling and UDI activities, and residential subdivisions, single-family residences, and commercial projects where zoning, development plans, subdivision plats, or impact fee assessment make them reasonably certain to occur, but no Federal nexus is anticipated. Areas where these cumulative effects are anticipated to occur include areas where Pima pineapple cactus have been documented and in suitable habitat. Cumulative effects are likely to contribute to habitat degradation and fragmentation.

- The applicant will offset the loss of 28.9 acres of Pima pineapple cactus habitat by purchasing 36.5 credits (thereby protecting 36.5 acres of Pima pineapple cactus habitat) in a FWS-approved conservation bank for Pima pineapple cactus. The bank provides protection in perpetuity for the cactus and its habitat and the bank contributes to the overall recovery and conservation of the species.

- Plans will be in place to address indirect effects from increased wildfire risk and the potential spread and introduction of invasive species that may affect Pima pineapple cactus and its habitat.

INCIDENTAL TAKE STATEMENT

Sections 7(b) (4) and 7(o) (2) of the ESA do not apply to listed plant species. However, protection of listed plants is provided to the extent that the ESA requires a Federal permit for removal or reduction to possession of endangered plants from areas under Federal jurisdiction, or for any act that would remove, cut, dig up, or damage or destroy any such species on any other area in knowing violation of any regulation of any State or in the course of any violation of a State criminal trespass law. Neither incidental take nor recovery permits are needed from us for implementation of the proposed action.

CONSERVATION RECOMMENDATIONS

Section 7(a) (1) of the ESA directs Federal agencies to utilize their authorities to further the purposes of the ESA 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.

- TEP should monitor the off-road vehicle use within the action area to determine if there are additional effects to Pima pineapple cactus and its habitat from increased access.

- TEP should monitor the other conservation measures for their effectiveness.

- TEP should participate in the stakeholder group in developing the recovery plan for Pima pineapple cactus.

In order that we are kept informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, we request notification of the implementation of any conservation recommendations.

Reporting Requirements/Disposition of Dead or Injured Listed Animals

Should a dead or injured threatened or endangered animal be found, initial notification must be made to the Service's Division of Law Enforcement, 2450 West Broadway #113, Mesa, Arizona 85202 (480-967/7900) 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, and any other pertinent information. Care must be taken in the handling of injured animals to ensure effective treatment and care and in handling dead specimens to preserve biological material in the best possible condition. If feasible, the remains of intact specimens of listed animal species shall be submitted as soon as possible to the nearest Service or AGFD office, educational, or research institutions (e.g. University of Arizona in Tucson) holding appropriate state and Federal permits.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution before implementation of the action. A qualified biologist should transport injured animals to a qualified veterinarian. Should any treated listed animal survive, we should be contacted regarding the final disposition of the animal.

REINITIATION-CLOSING STATEMENT

This concludes formal consultation with DOE on the proposed TEP transmission line in the Western Corridor. 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 maintained (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 that was not considered in this opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

We have assigned log number 02-21-0-F-0427 to this consultation. Please refer to that number in future correspondence regarding this consultation. Any questions of comments should be directed to Mima Falk at (520) 670-6150 (x 225) or Sherry Barrett at (520) 670-6150 (x 223).

Sincerely,

/s/ Steven L. Spangle
Field Supervisor

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
(Attn: Sarah Rinkevich)
Assistant Field Supervisor, Fish and Wildlife Service, Tucson, AZ

Bob Broscheid, Habitat Branch, Arizona Game and Fish, Phoenix, AZ
Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ
U.S. Army Corps of Engineers, Phoenix, AZ
Forest Supervisor, Coronado National Forest, Tucson, AZ
Bureau of Land Management, Tucson Field Office, Tucson, AZ
U.S. Boundary and Water Commission, El Paso, TX

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Appendix A

CONCURRENCES

In the November 18, 2003, request for formal consultation, you concluded that the proposed construction of the transmission line, located in the Western Corridor, was not likely to adversely affect the jaguar, Mexican gray wolf, Mexican spotted owl and its proposed critical habitat, southwestern willow flycatcher, Chiricahua leopard frog, Gila topminnow, and Sonora chub and its critical habitat. We concur with these findings based on the following reasons:

Jaguar (*Panthera onca*)

- There is one documented sighting of a jaguar (December 2001) from within two miles of the proposed action, in the Atascosa mountains. Jaguars have been documented in the border area, traveling northward from Mexico, perhaps looking for unoccupied habitat. Their use of the area has been incidental. There have been no documented breeding pairs or females in the area. Jaguars are primarily nocturnal and would be expected to avoid the construction sites. It is highly unlikely that a jaguar will be encountered during the construction phase of the project.

- Jaguars use riparian areas and canyon bottoms as dispersal corridors. There will be minimal construction activities in these areas on the FS. The road density will not be increased on the Forest because TEP will close one mile of road for each mile they construct. Also, the majority of road construction will consist of spur roads off existing roads, usually between 500-1000 feet in length. It is unlikely that this level of road construction will fragment the habitat or isolate patches of habitat to the extent that it that would inhibit jaguar movement. Therefore, the effects to jaguars will be insignificant. There is no designated critical habitat for this species, therefore, none will be affected.

- TEP will donate five remote cameras to the Jaguar Conservation Team. These are in addition to the 14 cameras that are already in place along the United States/Mexico border. These cameras will assist with the monitoring of jaguar movements across the border region. If jaguars are detected in the project area, consultation with us will be reinitiated.

Mexican gray wolf (*Canis lupus baileyi*)

- There are no known sightings of wolves in the project area. The nearest populations are on the Apache National Forest, many miles away from the project area.

- It is highly unlikely that wolves from Mexico will use the action area. Construction noise may affect the use of the area by wolves. The likelihood that wolves would be affected by the project is discountable because there are no known records from the action area.

Due to the linear nature of the project, the potential for noise disturbance and habitat destruction would be minimal if wolves were in the area.

Mexican spotted owl (*Strix occidentalis lucida*) and proposed critical habitat

- The proposed action passes within one mile of two Protected Activity Centers (PACs) near the Ruby Road. PAC # 0502015 contains portions of FS roads 4195 and 4196. There is a campground and numerous other roads in the vicinity of these PACs. There was confirmed occupancy of PAC # 0502015 in 1999. Monitoring in 2001 found no owls. PAC # 0502016 has been monitored several times since 1998, with no response. The route is crossing Sonoran Desert grassland and chaparral and not crossing through canyons or washes containing xeroriparian vegetation. The nest sites are suspected to be in the upper reaches of the canyons. In addition, TEP will avoid construction within one mile of the known PACs during the breeding season (March 1 to August 31). It is unlikely that owls, if they were present in the area, would be disturbed by the construction in the area.

- Mexican spotted owls are primarily nocturnal, and it is unlikely that collisions with construction vehicles would occur. This also minimizes the chances of disturbance from daytime construction activities.

- Possible collision with the powerline and electrocution are possibilities. TEP will construct the transmission line following guidelines suggested for raptor protection. The average wingspan of an adult Mexican spotted owl is 3.3 feet, much smaller than the distance between the transmission lines (18 feet). This greatly minimizes the chances of electrocution.

- There is a small amount of proposed critical habitat within the project area in Unit BR-W-13. The proposed route would permanently disturb 9.7 acres of proposed critical habitat and temporarily disturb 46.8 acres. The area where the proposed route traverses does not contain constituent elements of critical habitat. The canyons that support riparian vegetation, with the overstory required, are not present within the ROW. Most of the area is exposed ridgeline, supporting scrub species and chaparral, and it is fairly open. Large oaks and other trees that would typify critical habitat are not present. The washes in the area would not support the type of riparian trees needed for critical habitat. The washes are ephemeral in nature. Although the area is included within proposed critical habitat, the area encompassed by the proposed route does not support vegetation described as constituent elements of critical habitat.

- Mexican spotted owls may be affected by new roads and the potential for increased fire. The outlined conservation measures will minimize those effects such that they are insignificant and discountable.

Southwestern willow flycatcher (*Empidonax traillii extimus*)

- There is no suitable breeding habitat for southwestern willow flycatcher in the project area.

- The alignment crosses one riparian area, Sopori wash, which supports some xeroriparain vegetation. The wash does not support perennial water. This area might be used by migratory willow flycatchers. To minimize the effects of construction, the road width in this area will be limited to 12 feet Total disturbance to riparian vegetation will amount to 0.14 acre. Cottonwoods and willows that will be removed will be replaced at a 2:1 ratio. The effects to potential migratory willow flycatcher habitat will be temporary and short-lived and thus insignificant.

Chiricahua leopard frog (*Rana chiricahuensis*)

- No construction activities will take place in stock tanks or other occupied habitat of the frog.

- There are two occupied sites, Pena Blanca Spring and Sycamore Canyon, which are located downstream of construction areas. TEP will be implementing Best Management Practices, developed in conjunction with the FS, to minimize possible downstream sediment flow. It is anticipated that the distance (one mile) and the small area of construction in relation to the entire watershed, will result in an insignificant amount of sediment that could be deposited in occupied habitat.

- Chytrid fungus kills Chiricahua leopard frogs. The fungus can be introduced into areas in mud on boots, vehicle tires, and other equipment. To reduce the possibility of introducing the fungus into areas that do not already have it (it is known from Sycamore Canyon), TEP will set up cleaning stations (with a diluted bleach solution) to minimize the spread. The cleaning stations will be used when moving personnel and vehicles between wet zones.

- There is the possibility of frogs being run over by construction vehicles. Chiricahua leopard frogs can disperse up to five miles overland or through drainages and have been observed on Ruby Road. To significantly reduce this possibility, TEP will install silt fences along construction zones near the occupied sites. The fence will be at least two feet in height and buried to a depth of six inches. This should prevent frogs from entering the construction site, and render the possibility of them being run over discountable.

Gila topminnow (*Poeciliopsis occidentalis occidentalis)*

- There is no occupied or suitable habitat for Gila topminnow in the project area.

- The nearest location of occupied Gila topminnow habitat is in the perennial portions of the Santa Cruz River, located east of the project area. It is unlikely, due to the distance

and the I-19 freeway, that any sediment associated with construction of the transmission line will affect occupied habitat. The BMPs that will be in place will further minimize sediment transport. Therefore, effects to Gila topminnow are discountable.

Sonora chub (*Gila ditaenia*)

- No construction activities will occur in occupied habitat in Sycamore Canyon.

- One occupied site, Casita Spring, is located within 656 feet of proposed construction. There is the possibility of increased sediment from road construction. With the BMPs in place, sediment associated with road construction should be minimized. The amount of sediment that may be transported into the spring would be greatly reduced. In the event of a large rainfall event, the amount of sediment runoff would be insignificant compared to overall sediment runoff from the watershed. The possible effects to Casita Springs from road construction would be insignificant (small area of construction) and discountable (low frequency of rainfall events). In addition, this particular road will be closed and revegetated after construction, so it does not become a permanent source of sediment.

- Critical habitat for Sonora chub has been designated in Sycamore Canyon. The critical habitat is downstream of the proposed alignment (Hank and Yank spring is one mile from the route), and the BMPs will reduce the amount of sediment that may enter Sycamore Canyon.