United States Department of the Interior

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In Reply Refer To:
AESO/SE
02-21-05-F-0518

November 29, 2005

Memorandum

To: Acting Regional Director, Bureau of Indian Affairs, Western Regional Office, Phoenix, Arizona

From: Field Supervisor

Subject: Biological Opinion for the Construction of Route 25 on the Tohono O'odham Nation, Pima County, Arizona

Thank you for your request for formal consultation with the U.S. Fish and Wildlife Service (FWS) pursuant to section 7 of the Endangered Species Act of 1973 (16 U.S.C. 1531-1544), as amended (Act). Your request was dated April 6, 2005, and received by us on April 8, 2005. At issue are impacts that may result from your proposed road and bridge construction on Bureau of Indian Affairs (BIA) Route 25, located approximately seven miles east of Sells, Pima County, Arizona. The proposed project will take place within the boundaries of the Tohono O'odham Nation (TON). The proposed action may affect the endangered cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*; pygmy-owl).

This biological opinion (BO) is based on: (1) information provided in the March 2005 Biological Assessment (BA) prepared by the BIA; (2) a February 14, 2003, site visit with the BIA and TON; and (3) other sources of published and unpublished information. Literature cited in this BO is not a complete bibliography of all literature available on the pygmy-owl, the effects of road construction, or on other subjects considered in this BO. A complete administrative record of this consultation is on file at this office. We have assigned log number 02-21-05-F-0518 to this project. Please refer to that number in future correspondence on this consultation.

BIOLOGICAL OPINION

Consultation History

- February 14, 2003: We accompanied the BIA on a site visit to discuss the project and potential effects to the pygmy-owl.
- April 6, 2005: We received the BA and request for formal consultation.
- June 23, 2005: We sent our 30-day letter to BIA indicating that formal consultation had been initiated.
- August 30, 2005: We sent a letter to BIA requesting a 45-day extension to complete the BO.
- October 24, 2005: We sent the draft BO to BIA.
- November 21, 2005: BIA notified us that they, and the Nation, had no comments on the draft BO.

Description of the Proposed Action

The BIA is proposing to upgrade 1.93 miles (mi) of existing dirt road known as BIA Route 25, located on the TON, in the east-central portion of the Nation, approximately seven miles east of Sells, Arizona. Two roads, known collectively as BIA Route 25, provide access to the village of Fresnal. Fresnal Road extends west off of State Route (SR) 86 at milepost (MP) 121.2. Fresnal Loop Road extends west off of SR 86 at MP 120.1, turns north briefly, and then turns east back to SR 86 at MP 120.3. The primary purpose of the road project is to provide safe, all-weather access to the village of Fresnal.

The proposed action would consist of constructing a standard 24-foot, bituminous-surfaced road by grading and draining the existing dirt roadways and applying two inches of asphaltic concrete (AC) over six inches of aggregate base (AB). The finished road would include two 12-foot travel lanes and 1-foot surfaced outside shoulders. Construction outside of the existing road would only be for the purpose of complying with Federal design standards for minimum curves, tangents, and grades and to construct drainage features. Work will also include the construction of a 100-foot long, pre-cast concrete girder bridge over Sells Wash.

The average construction limit for the roads is approximately 90 feet in width, for a total of approximately 21 acres of project footprint. The existing roadway averages 18 feet in width and is within part of the new construction limits for approximately 85% of its length, so approximately 3.5 acres are already disturbed and devoid of vegetation. Total new disturbance would be approximately 17.5 acres. There are nine saguaros inside the construction limits.

The proposed action will require the creation of a borrow pit, located approximately 0.75 mi. west of Fresnal Road at a point one mile north of SR 86. If used completely, a maximum of approximately nine acres would be disturbed. No saguaros will be affected.

Road construction will be conducted between August 1, 2006-February 1, 2007 and August 1, 2007-February 1, 2008. The duration of the project is expected to be 160-180 days during each construction season.

Conservation Measures

The BIA has included a number of conservation measures within the project description. They have committed to implement the following conservation measures in order to minimize the potential effects of this project on the pygmy-owl:

- Pygmy-owl surveys will be conducted in 2006 and for each successive year in which construction is planned.

- All construction activities will be confined to the period between August 1 and February 1. These timing limits will become part of the Construction Specification Special Provisions.

- The areas inside the staked construction limits will not be completely cleared and grubbed. Saguaros that are near the perimeter will be left in place, undisturbed. Individual saguaros beyond the minimum 10-foot clearance zone, and not in a cut-and-fill section, will be left in place if at all possible. Saguaros at the very toe of fill slopes will be left intact, and fill will be placed around them, up to one foot in depth. These measures are designed to minimize the number of saguaros that have to be transplanted.

- The Contractor will be briefed on the sensitivity of the flora and fauna in the area. Vehicles and equipment will not be allowed to travel beyond that distance absolutely necessary to construct the road. All saguaros beyond the construction zone are to be avoided.

- The Contractor will salvage and relocate all transplantable saguaros prior to the start of clearing. When complete, the Contractor will indicate remaining “leave in place” saguaros with lath marked with high-visibility paint.

- All disturbed areas will be seeded with a native seed mix that includes low-growing brush species.

- The Contractor will mitigate xeroriparian vegetation impacted at the Sells Wash bridge through planting, seeding, or a combination of both.

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.

Listing and Critical Habitat

The Arizona population of the pygmy-owl was listed as an endangered distinct population segment on March 10, 1997, (USFWS 1997) without critical habitat. In response to a court order,
we published a proposal in the Federal Register on November 27, 2002 (USFWS 2002) to designate critical habitat on approximately 1,208,000 acres in portions of Pima and Pinal counties, Arizona. On August 3, 2005, we proposed to delist the Arizona distinct population segment of the pygmy-owl and withdraw our proposed designation of critical habitat (FR 70: 44547-44552). Until a final rule delisting the pygmy-owl is published, the listing and all protections under the Act remain in place.

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, which 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 (USFWS 2003).

Life History

Pygmy-owls are considered non-migratory throughout their range. There are winter (November through January) pygmy-owl location records from throughout its historical range in 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 migrate seasonally.

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). A nest in an ash tree and a nest 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 that may be established by dispersing pygmy-owls. Pygmy-owls are more likely to be affected by projects within their home ranges because of the species' strong site fidelity. Behaviorally, the option for resident pygmy-owls to seek alternative areas outside of the home range appears limited, at least for males.

Data on the size of areas used by pygmy-owls on an annual basis in Arizona are limited. Most telemetry data are gathered during the breeding season due to increased capture success 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 3 and 57 acres during the incubation period, they defend areas of up to 279 acres in the winter. Proudfoot and Johnson (2000) indicate that 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, we consider a 280-acre home range 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).

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 utilized 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.

Freestanding 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). It is described as a 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 florida*), foothills paloverde (*P. microphylla*), ironwood (*Olneya tesota*), mesquites (*Prosopis* spp.), and acacia (*Acacia* spp.). The paloverde-cacti mixed scrub series is described as developed on the bajadas and mountainsides away from valley floors. 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 vegetatively suitable for pygmy-owls. Preliminary habitat assessment data appear 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 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). An abundance of saguaros or large trees and a diversity of plant species and vegetation strata characterize

occupied desertscrub communities. In Arizona, 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 1,200 meters (m) (4,000 feet (ft)) (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). 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 (dry washes) 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

Only the Arizona population of the pygmy-owl is listed as an endangered species (USFWS 1997). 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).

Documentation of the total number of pygmy-owls and their current distribution in Arizona is incomplete. This is due to the lack of systematic or comprehensive surveys throughout the pygmy-owl's historical range in Arizona, and respect for Tohono O'odham Nation's request to keep information related to pygmy-owls on the TON within tribal control. Survey and monitoring work in Arizona resulted in documenting an average of about 29 adult pygmy-owls per year over the past six years (1999 – 2004). Over this same period, an average of eight nests

per year has been recorded. In 2004, we documented a total of 20 adult pygmy-owls and only four nests, a continuation of the low numbers observed in 2003. For comparison, the highest number of adult pygmy-owls recorded for a single year was 37 in 1999, and the most nests documented in a single year was 13 in 2001 (AGFD 2002a)[1]. Most of the pygmy-owls have been 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 for the reasons mentioned above, we do not have complete information.

In addition, recent survey information has shown pygmy-owls to be more numerous in Mexico adjacent to and near the Arizona border than early information indicated (Flesch and Steidl 2000). There also exists considerable unsurveyed habitat on the TON 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 TON 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 "rescue" 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 3.9 km (2.4 mi) from its nest site following dispersal. Five young monitored with radio telemetry during 1998 were recorded dispersing from 3.5 km (2.17 mi) to 10.4 km (6.5 mi) for an average of 5.9 km (3.6 mi) (Abbate *et al.* 1999). In 1999, 6 juveniles in Arizona dispersed from 2.3 km (1.4 mi) to 20.7 km (12.9 mi) for an average of 10 km (6.2 mi) (Abbate *et al.* 2000). In Arizona, the maximum documented dispersal distance documented prior to 2004 was 34.8 km (21.8 mi) (AGFD 2002b). However,

[1] These figures do not include documented pygmy-owl locations on the Tohono O'odham Nation.

monitoring of a dispersing female pygmy-owl in 2004 has revealed a total distance traveled of approximately 240 km (80 mi)(AGFD 2004), indicating that the dispersal potential for pygmy-owls may be much greater than originally documented.

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, but may move up to 1.6 km (1 mi) 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 (the area used on an annual basis). 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).

Threats to the Species

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 in the 1997 listing that the following three factors applied to the pygmy-owl - Arizona Distinct Population Segment (DPS) to the extent that endangered status is appropriate (USFWS 1997). Below we provide a brief summary of current threats to the species; a full discussion can be found in the final listing rule (USFWS 1997).

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

The pygmy-owl is threatened by present and potential 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 (USFWS 1997, 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 within some portions of its range in Arizona (Abbate *et al.* 1999).

Factor D - Inadequacy of existing regulatory mechanisms.

Although the pygmy-owl in Arizona is considered non-migratory, 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 laws, 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 E - Other natural or manmade factors affecting its continued existence.

- *Genetics* - Recent genetic research suggests that pygmy-owls in the action area show evidence of genetic separation from other populations in Arizona and Mexico (Proudfoot and Slack 2001).

- *Pesticides* - Application of pesticides and herbicides in Arizona occurs year-round, and these chemicals may pose a threat to the pygmy-owl.

- *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.

- *Predation* - 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.

- *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.

<u>Rangewide Trend</u>

Data collection related to the pygmy-owl has only been consistent throughout the State for the past few years. 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 an exact population size or trend within Arizona. Additionally, the TON supports pygmy-owls, but complete information on the numbers and distribution of pygmy-owls on the Nation are 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 much more 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) led to initial declines in species abundance and distribution in Maricopa County.

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. The numbers of documented adult pygmy-owls and nest sites has declined substantially over the past three years. Although documented since 1996, no nesting was documented in northwest Tucson or in Organ Pipe Cactus National Monument (OPCNM) in 2003 and 2004. The number of pygmy-owls and nests in Altar Valley has also declined. It is likely that the ongoing drought has influenced the survival and productivity of pygmy-owls in all areas of Arizona. However, when drought conditions no longer persist, the potential for pygmy-owl populations to rebound relatively quickly exists, particularly with support from the Mexican population. Pygmy-owls breed and reproduce during their first year (Proudfoot and Johnson 2002). The average number of young fledged per successful nest site is over three (AGFD 2003). Several nests have produced five fledglings (Abbate *et al*. 1999, 2000).

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 1,113 km (Flesch and Steidl 2000, Flesch 2003b). These pygmy-owls were detected from the international border south to the Sonora/Sinaloa border, with the exception of the area around Hermosillo where agricultural and buffelgrass 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, we have little 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 (*Pennisetum ciliaris*), 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, "Given 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. In order to reverse the current decline in the pygmy-owl population in Arizona, an influx of pygmy-owls from Mexico will likely be required. However, the long-term potential for Mexico to provide this source of immigrant pygmy-owls is uncertain. Therefore, the importance of existing Arizona pygmy-owl populations may increase if populations south of the border become imperiled.

Since listing in 1997, we have evaluated approximately 871 actions that have had potential effects to pygmy-owls. The number of actions we evaluate continues to go up every year. In addition, two Habitat Conservation Plans have been completed for pygmy-owls, and three large multi-species Habitat Conservation Plans are being developed which include the pygmy-owl as a key species. As a reference for current levels of activity, in 2004, we evaluated 156 actions, including one emergency consultation, 49 informal consultations (these are actions that included sufficient measures to avoid or minimize impacts to the pygmy-owls so that the effects were insignificant or discountable), five formal consultations (these are actions where adverse effects to pygmy-owls are anticipated), and 101 technical assistance projects. Technical assistance is given for projects that have no Federal nexus. These actions have no legal requirement to follow the recommendations we provide, 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. Already in 2005, we have evaluated 192 actions, including 2 emergency consultations, 21 informal consultations, six formal consultations, and 163 technical assistance projects.

While many of these actions evaluated since the listing of the pygmy-owl have had adverse effects on the pygmy-owl, it is important to note that none of these actions were authorized for lethal "take" of a pygmy-owl. We only anticipated "take" in the form of harm or harassment.

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 that are contemporaneous with the consultation process. The environmental baseline defines the current status of the species and its habitat in the action area to provide a platform to assess the effects of the action now under consultation.

Action Area

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (50 CFR §402.02). In the BA, no action area was specifically delineated. Considering potential direct effects related to habitat impacts and noise/activity disturbance within occupied pygmy-owl home ranges, and the indirect effects of habitat fragmentation and impediments to movements and dispersal, we have defined the action area for this project as the BIA R/W (150-foot width) and the area within 600 meters of the right-of-way, along the 1.93 miles of the road. It also includes 600 meters around the perimeter of the borrow pit.

Environmental Setting

The action area lies between approximately 2,622 ft. and 2,660 ft. elevation in flat to gently rolling terrain in the Baboquivari Valley, surrounded by the Artesa Mountains to the west, the

Quinlan and Baboquivari Mountains to the east, and the South Comobabi Mountains to the north. No surface water or wetlands occur within the project limits.

The action area is within the foothill paloverde-saguaro cacti dominated Arizona Upland Sonoran desertscrub vegetation community (Brown 1994). Saguaros are present, but widely scattered and sparse. The plant community is dominated by mesquite, creosote (*Larrea tridentata*), triangle-leaf bursage (*Ambrosia deltoidea*), and prickly pear and cholla (*Opuntia* spp). Along Sells Wash, the vegetation is dense, and dominated by mesquite and catclaw (*Acacia greggii*). Desert hackberry (*Celtis pallida*) is scattered throughout. The borrow pit is located in a mesquite and creosote flat with triangle-leaf bursage scattered throughout.

Factors Affecting Species' Environment Within The Action Area

The proposed project is totally surrounded by TON lands. Previous consultations within the TON included road improvements, fiber optic lines, water lines, water treatment plants, and farm operations. Many of these projects are linear in nature, have primarily temporary impacts, or do not result in significant impacts to pygmy-owls or pygmy-owl habitat. All but two consultations have been informal in nature. The extent of residential and commercial development within the TON has been limited. Undeveloped areas within the town limits are common. Livestock grazing occurs within the action area on a year-round basis, but the numbers of livestock are limited, especially during the current drought. Typically, only one or two consultations per year occur within the TON. Unlike areas in the Tucson Basin, activities within the TON are typically small in scale and have limited impacts.

Because of the lack of significant land-disturbing activities, much of the area within and adjacent to BIA Route 25 is potential pygmy-owl habitat. Relatively few pygmy-owl surveys have been conducted on the TON; however, biologists with the Tohono O'odham Wildlife and Vegetation Management Program or their contractors have conducted pygmy-owl surveys in association with project-clearance activities. No general occupancy or research surveys have been conducted. Specifically, the action area was surveyed from 2003 – 2005. A single detection was made in 2003, and there were no detections on Route 25 during the 2004 spring survey. TON confirmed the initial detection and verified that there was an active breeding site located less than 400 m. from the roadway and bridge site. During the spring 2005 survey, a confirmed detection was made in the same area as the 2003 detection.

Washes provide important pygmy-owl habitat elements. The increased availability of moisture within washes results in enhanced vegetation cover and increased prey availability.

Roads have the potential to affect pygmy-owl movements and dispersal by creating open areas without vegetation cover and through mortality associated with automobile collisions. The likelihood of impacts increases with the increasing width of the cleared right-of-way, the volume of traffic, and the speed of travel along the roadway. The surfacing of BIA Route 25 is not expected to increase the amount of traffic using the roads as the number of residents in the village is not expected to increase. There is no future development planned for this area.

Currently, proposed critical habitat for the pygmy-owl does not include the TON (USFWS 2002). While no recovery areas have been formally designated on the TON, it is likely that the pygmy-owls and pygmy-owl habitat found within the TON will contribute to the recovery of the pygmy-owl.

Effects of the Proposed 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 interdependent or interrelated with the action that will be added to the environmental baseline. Interrelated actions are those that are part of the 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 construction. 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

The proposed action could directly affect a pygmy-owl if construction occurs within an occupied pygmy-owl home range. Direct effects include the actual loss of pygmy-owl habitat within an occupied home range. Additional direct effects include the disturbance of nesting or resident pygmy-owls to the extent that it affects their ability to carry out normal behavioral activities such as feeding, breeding, or sheltering. Disturbance could potentially affect pygmy-owl dispersal if project activities are ongoing within an area used by dispersing pygmy-owls. Due to the proximity (less than 600 m.) of an active pygmy-owl nest site to the proposed construction area, construction will take place outside of the pygmy-owl breeding season, so effects from noise should be temporary in nature and greatly reduced.

A pygmy-owl home range is defined as being 280 acres in size. In areas of homogeneous habitat, this can be determined by a circle with a radius of 600 meters centered on the nest site or activity center of resident pygmy-owls. The construction of BIA Route 25, bridge placement, and the borrow pit excavation will result in the loss of 17.5 acres of pygmy-owl habitat (26.5 acres if all of the borrow pit area is used), including approximately 8 acres within an occupied territory. After revegetation, there will be a permanent loss of just over 12 acres of habitat; 5.5 acres of that within the occupied territory. All nine saguaros that are within the construction limits will be transplanted, and the occupied saguaro will not be directly affected by the proposed action.

Indirect Effects

Implementation of the proposed action will increase the width of unvegetated roadway within the action area. Pygmy-owls are capable flyers, but rarely make flights greater than 40 meters (120 feet) (AGFD 2003). Typical flight patterns are more likely to be from one tree to another nearby tree, avoiding long flights in open areas, presumably to avoid exposure to predation (AGFD 2003). However, increased opening size (i.e., gaps between trees or large shrubs), coupled with increased threats (e.g., moderate to high traffic volumes and other human disturbances), are thought to restrict pygmy-owl movement.

Wide roadways and associated clear zones cause large gaps between tree canopies on either side of roadways and may result 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. Observations of a pygmy-owl flying across wide roadways by consultants to the Tohono O'odham Nation indicate that they can adjust their flight pattern in response to roads – flying high and straight without the characteristic swoop. Roads present a mortality hazard to foraging and dispersing pygmy-owls. Roads can disrupt the tree-to-tree flight pattern of the pygmy-owl; a road's width may discourage a pygmy-owl from crossing, or pygmy-owls that do cross may be struck by passing automobiles. 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 utilized 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.

The revegetation efforts will narrow the corridor that is disturbed to less than 40 feet, and there is documentation of pygmy-owl dispersal crossing paved roads similar to Route 25. In addition, the roads are not very long (the longest being 1.2 mi.), and the roads are not expected to represent a significant barrier to pygmy-owl movement and dispersal.

Interrelated and Interdependent Actions

We are unaware of any interrelated or interdependent actions associated with the project.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local, or private non-Federal 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. Most of the projects occurring within the TON have a Federal nexus through the Bureau of Indian Affairs, Indian Health Services, Federal Highway Administration, or Rural Utilities Service. Non-Federal activities (e.g. livestock grazing) are expected to continue at current low levels, and the FWS is unaware of any projects proposed within the action area.

Conclusion

After reviewing the current status of the pygmy-owl, the environmental baseline for the action area, the effects of the proposed roadway and associated activities, and cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the pygmy-owl. Critical habitat has been proposed for this species; however, critical habitat has not been proposed within the TON. Therefore, no destruction or adverse modification of critical habitat is anticipated. In making our determination, we considered the following:

- One pair of pygmy-owls is located adjacent to the action area. However, the proposed action includes measures that reduce the likelihood of direct effects to these pygmy-owls. Construction will occur outside the breeding season.

- Salvageable saguaros will be transplanted on-site, thus minimizing the loss of potential pygmy-owl habitat. Disturbed areas will also be reseeded to further minimize effects to the habitat. Xeroriparian habitat disturbed within Sells Wash will be replaced by planting, seeding, or a combination of both.

- Traffic volumes are not anticipated to increase as a result of the proposed action.

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

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, or to attempt to engage in any such conduct. "Harm" is defined (50 CFR '17.3) to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. "Harass" is defined (50 CFR 17.3) as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavioral patterns that 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

Due to the proposed avoidance and minimization measures, the FWS does not anticipate the proposed action will incidentally take 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 that the BIA implement the following discretionary actions:

- Conduct or fund studies, using both monitoring and telemetry, to determine pygmy-owl habitat-use patterns and relationships between roadways and 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.

- Cooperate with the TON to develop a conservation plan for the pygmy-owl.

- Assist in the implementation of recovery tasks identified in the pygmy-owl Recovery Plan once the Plan is approved by us.

- Monitor the effectiveness of conservation measures associated with road projects.

REINITIATION-CLOSING STATEMENT

This concludes formal consultation with the BIA on the proposed improvement of BIA Route 25 within the TON, in Pima County, Arizona. 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 appreciate the BIA’s efforts to identify and minimize effects to listed species from this project. For further information, please contact Mima Falk at (520) 670-6150 (x225) or Sherry Barrett at (x223).

Please refer to consultation number 02-21-05-F-0518, in future correspondence concerning this project.

/s/ Steven L. Spangle

cc: Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
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