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In Reply Refer To:
AESO/SE
02-21-02-F-0333

September 15, 2004

Ms. Cindy Lester P.E.
Chief, Arizona Section
Regulatory Branch
U.S. Army Corps of Engineers
Arizona-Nevada Area Office
3636 North Central Avenue, Suite 900
Phoenix, Arizona 85012-1939

File Number: 2001-00794-RJD

Dear Ms. Lester:

This letter is in response to your November 6, 2003, request for formal consultation under the Endangered Species Act of 1973, as amended, on the effects of the Town of Marana's proposal to construct interrelated flood control improvements within the Santa Cruz River, Yuma Mine Wash, and two unnamed washes. In this biological opinion, we evaluate the effects of several projects including: (1) improvements to Silverbell Road between Ina Road and Cortaro Road; (2) improvements to Ina Road between Interstate 10 (I-10) and Silverbell Road, including two new bridges across the Santa Cruz River; (3) development of the 48-acre Cortaro District Park; and (4) west bank stabilization of the Santa Cruz River from Ina Road to Cortaro Road on the cactus ferruginous pygmy-owl (*Glaucidium brasilianum cactorum*). The proposed improvements are located in Sections 35 and 36 in Township 12 South, Range 12 East and Sections 1 and 2 in Township 13 South, Range 12 East in the Town of Marana, Pima County, Arizona. We received your letter on November 12, 2003.

This biological and conference opinion (collectively BO) will address the potential effects of the proposed action on the pygmy-owl and its proposed critical habitat and is based on: (1) the April 2003 WestLand Resources, Inc. (WestLand, applicant's consultant) *Resource Report – Silverbell Road Realignment, Ina Road Widening and Bridge Replacement, Santa Cruz River Bank Stabilization, Cortaro Road District Park Development* (Resource Report), prepared for your office on behalf of the Town of Marana; (2) WestLand's August 15, 2003, *Biological Assessment – Silverbell Road Realignment, Ina Road Widening and Bridge Replacement, Santa Cruz River Bank Stabilization, Cortaro Road District Park Development* (Biological Assessment); (3) WestLand's October 1, 2003, Technical Memorandum entitled *Design Revisions and Associated Impacts Along the Santa Cruz River and Summary of All Impacts Associated with the Silverbell/Ina/District Park/Bank Stabilization Project – WestLand Project No. 311.10 A 802*

(Technical Memorandum); (4) correspondence and communication between the applicant and us; and (5) various published and unpublished sources of information.

Our July 28, 2004, draft biological opinion on the proposed action (see consultation history, below) included a determination (Appendix A) that the proposed action is not likely to adversely affect the endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*). We have noted your and the Town of Marana's objections to this determination in your respective comment letters. We have removed Appendix A from this final biological opinion, but recommend that a letter documenting the biological rationale for your "no effect" determination be included in your administrative record for the proposed action.

A complete administrative record is on file at this office. We have assigned log number 2-21-02-F-0333 to this project. Please refer to that number in future correspondence on this consultation.

BIOLOGICAL OPINION

Consultation History

- July 17, 2001: We notified WestLand that they could cease performing pygmy-owl surveys along the Ina Road alignment due to that site's lack of habitat and high degree of disturbance.
- December 17, 2002: We met with the Town of Marana to discuss the proposed action and its effects on threatened and endangered species.
- April 30, 2003: We again met with the Town of Marana regarding the proposed action.
- August 18, 2003: We received a courtesy copy of the August 15, 2003, Biological Assessment.
- October 1, 2003: We received a letter from WestLand providing a corrected version of Appendix C for the Biological Assessment.
- October 3, 2003: We received a courtesy copy of the Technical Memorandum.
- November 12, 2003: We received your request for formal consultation on the proposed action.
- December 7, 2003: We sent you a letter stating that sufficient information had been received and that formal consultation was underway.
- January 5, 2004: We received a courtesy copy of the December 23, 2003, correspondence between the Environmental Protection Agency (EPA) and your agency regarding the proposed action.

- June 9, 2004: We met with Jennifer Christelman of the Town of Marana and James Tress and Kimberly Otero of WestLand to discuss issues related to habitat connectivity through the project site
- June 29, 2004: We received the 2004 pygmy-owl survey results for the proposed action from Westland.
- July 28, 2004: We transmitted a draft, non-jeopardy/non-adverse modification biological opinion to you, the Town of Marana, and WestLand. After an error during mailing, a second copy of the draft biological opinion was transmitted to the Town of Marana on August 11, 2004.
- August 25, 2004: We received the U.S. Army Corps of Engineers' (ACOE) August 24, 2004, comments on the July 28, 2004, draft biological opinion. August 20, 2004, comments from the Town of Marana were included as an enclosure to your letter, and were also obtained via electronic mail from the applicant on August 30, 2004.

Description of the Proposed Action

The following project description was adapted from the Biological Assessment, and includes measures intended to avoid and minimize adverse effects on the pygmy-owl and its requisite habitat in the project area. Measures described as "mitigation" are those associated with offsetting impacts to Jurisdictional Waters in association with the proposed action's Department of the Army Permit. In the Effects of the Proposed Action section, below, these actions will be identified as avoidance and minimization measures, a terminology more applicable to section 7 consultation.

Silverbell Road Realignment and Widening

An approximately 0.8-mile stretch of Silverbell Road will be expanded and realigned from Cortaro Road south to Ina Road. The improvements will also include the intersection and short approach segments to the south and west. The ROW (ROW) for this stretch of road would be increased to 150 feet. Expansion will allow for two lanes of traffic flow in each direction, a continuous left-turn lane, a multi-use lane in each direction, curbing, gutters, and sidewalks. All adjustments to the horizontal and vertical alignments will accommodate a design criterion 50 miles per hour (mph) speed limit. The horizontal alignment for this project will closely match the existing ROW with two exceptions. An existing reverse curve, located approximately 0.4 mile to 0.6 mile south of Cortaro Road, does not meet the design criterion for 50 mph, and a second horizontal curve immediately north of the Ina Road and Silverbell Road intersection will require shifting. The realignment of the roadway in these areas will result in shifting the road to the east. In addition, the proposed project includes widening all four approaches to the intersection at Ina Road, to accommodate current and future traffic volumes. The proposed activity would require removal of native vegetation adjacent to the roadway, re-contouring the existing landscape, and placement of box culvert crossings to control surface water flows through the project area.

It is proposed that all-weather travel will be accomplished with the installation of several culverts at the concentration points where significant runoff intersects Silverbell Road. These culverts will convey 100-year discharge under the roadway and towards the Santa Cruz River located to the east. The proposed alignment of Silverbell Road will be super-elevated throughout the project area, making it infeasible to allow for overtopping of the roadway as a design consideration. In addition to providing improvement for the existing drainage conditions, the proposed drainage modifications will consider the anticipated increase in discharge conditions as a result of proposed developments upstream of Silverbell Road in the future. These developments are expected to contribute to an increase in discharge across the subject stretch of Silverbell Road.

Eleven culverts are proposed within the Silverbell Road Project Area from Cortaro Road to Ina Road, including the Silverbell and Ina Roads intersection. Currently, there are four pipe culverts within the project area, which convey flows beneath Silverbell Road or Ina Road. These improvements are designed to prevent roadway flooding and to maintain downstream flows. The locations and dimensions for each culvert are described in greater detail in the Biological Assessment.

In addition to the eleven culverts, a constructed channel will be placed adjacent to and southwest of the new Silverbell and Ina Road intersection. This channel will be designed to capture sheet flow from the west and south and direct these flows to the inlet of Culvert 7 located southwest of the intersection. The outflow from Culvert 7 will be further carried through an above ground concrete drainage channel northeast of the intersection and into Culvert 8. These flows ultimately will arrive at a constructed berm northeast of the intersection.

Culverts will be installed at 5 jurisdictional crossings along Silverbell Road, which will result in the loss of approximately 0.8 acre of jurisdictional waters. These locations along Silverbell Road are currently at grade dip crossings, which are often flooded as a result of storm events. The culvert features are designed to prevent roadway flooding and to maintain downstream flows. Two culverts will be installed on an unnamed jurisdictional drainage located west of the intersection, which will result in the permanent loss of 0.04 acre of waters of the United States and one where the drainage crosses Silverbell Road, which will result in the permanent loss of 0.02 acre of waters of the United States.

Ina Road Widening and Bridge Replacement, Reconstruction of the Bank Protection, and Grade Control Structure Upgrade

The limits of the Ina Road project are from the Silverbell Road intersection on the west to the frontage road along the eastbound Interstate-10 on the east, a distance of approximately 1.2 miles. These limits also include the area 0.5 mile north and south of the existing ROW centerline of Ina Road along the Santa Cruz River and 300 feet north and south of the existing ROW centerline of Ina Road throughout the remaining portions of the roadway within the east and west limits. The existing Ina Road ROW is 150 feet wide. Ina Road will be upgraded and widened to include four travel lanes, two in each direction, and a 20-foot median. The design also includes installation of multi-use lanes, curb and gutters, sidewalks, drainage facilities,

safety lighting, new traffic signal system, traffic signal modification(s), landscaping/irrigation, a multi-modal node at the Ina Road intersection with the Santa Cruz River and art work.

The existing Ina Road Bridge at the Santa Cruz River will be removed and replaced with two (2) new bridges. The design of the bridge will span a minimum of 626 feet, similar to the existing bridge. The width will be in accordance with the proposed roadway improvement configuration of Ina Road and the new bridge will be designed for the 100-year design flow of 80,000 cfs for the Santa Cruz River. The bridge plans provide for two separate structures, one eastbound and one westbound separated by a 13-foot open median, for a total width of 43 feet for each bridge. Figure 6 of the BA illustrates the Ina Road bridge typical cross-section. Construction of the new bridges will require the removal and reconstruction of the existing bank protection at those locations.

Placement of the bridge piers will result in the permanent loss of 0.04 acre of jurisdictional waters and wetlands associated with the Santa Cruz River.

There is an existing grade/drop control structure located downstream of the existing bridge. The results of a Grade Control Structure Stability Analysis indicate that the existing grade control structure has serious deficiencies that warrant high priority stabilization measure to restore and sustain its structural integrity. Pima County Department of Transportation (PCDOT) has concurred with these findings. The study found that the structure's 3-foot thick soil cement cap and downstream soil cement face have undergone progressive failure due to continual effluent flows from the upstream wastewater treatment plants. Eventual failure of the grade control structure is anticipated if corrective measures are not taken. Failure of the control structure could further threaten the integrity of the Ina Road Bridge and associated bank protection.

Early conversations among engineering consultants, the Town of Marana, and the Pima County Flood Control District determined that the grade control structure is part of the Pima County Flood Control Inventory and would not be included in this project, with the exception of modifications during removal and replacement of the existing bridge. Subsequent to those findings, it has been decided that the grade control structure will be rehabilitated.

To rehabilitate the structure, a series of up to five weirs will be constructed on top of the refaced surface. The purpose of the weir option is to disperse base and flood flows across a wider stream channel than would otherwise exist, reducing scour and erosion. The weir option will also maintain the current accumulation of water upstream and downstream of the structure, thus increasing wetland area as compared to the single spillway option.

Santa Cruz River Bank Stabilization

Bank stabilization will be installed along the west bank of the Santa Cruz River from Cortaro Road south to the Ina Road Bridge, a distance of approximately 1.4 miles. The bank stabilization will be installed at 1:1 slope and will support a 50-foot wide linear feature adjacent to the river corridor. This area will be designed as a 14-foot-wide pedestrian pathway with the remaining area available for utilities, if needed at some point in the future. Bank stabilization will be accomplished using standard soil-cement streambank protection methods.

The Applicant is proposing to construct two box culverts through the bank stabilization to allow drainages crossing the park area to discharge to the Santa Cruz River. The north drainage will be diverted to the southeast and confluence with the central drainage, the combined flows will be conveyed across the park through a single 12-foot-by-10-foot box culvert. The drainage along the southern boundary of the park will be channelized, and will collect flows from the two southern washes to be discharged through a triple 12-foot-by-12-foot box culvert. Flows from the southern two washes will drain north along the proposed bank stabilization before entering the southern box culvert. The project will include revegetating the top of the bank, as well as the slopes with native vegetation. Planting of native trees will enhance the area for pedestrian use and is intended to provide habitat for wildlife species. Installation of the bank stabilization will result in the permanent loss of approximately 14.23 acres of jurisdictional waters and 1.25 acres of wetlands along the Santa Cruz River.

Cortaro District Park

The 48-acre Cortaro District Park will contain a library, a community center, ball fields, and open space for active and passive recreation opportunities. As proposed, the park development will involve the stabilization for several ephemeral washes, which conduct storm water flows from west of Silverbell Road to discharge into the Santa Cruz River. The southern portion of the area will be left as open space to allow for connectivity along the Yuma Mine Wash to the Santa Cruz River. The northern portion will be developed with buildings and active recreation amenities. Direct fill and rechannelization of the washes that cross the property will result in the permanent loss of approximately 0.92 acre of jurisdictional waters.

Description of the Proposed Conservation Measures

Conservation Measures Common to All Projects

On-going Survey Requirements for the Cactus Ferruginous Pygmy-owl

Culvert installation, road construction activities, or other permitted activities that have not commenced at a site prior to January 1st of any given will be surveyed for pygmy-owls following the protocol adopted by the U.S. Fish and Wildlife Service (FWS) in January 2000. In the event that this occurs, no construction activity can occur until three surveys have been conducted between January 1 and June 30. Should a pygmy-owl be detected during these surveys, every effort will be made to determine its breeding status and nest site location. If a pygmy-owl is detected within 600 meters of the project site, and if the detection is determined to be a territory¹,

¹ For purposes of this Biological Opinion, a "territory" shall be considered 280 acres in size centered on a known nest site or activity center that meet the criteria outlined below.

The presence of a pygmy-owl territory will be determined and based upon pygmy-owl surveys conducted between January 1 and June 30 using the adopted pygmy-owl protocol. If a pygmy-owl is detected during this period, reasonable effort shall be expended, in cooperation with the FWS and Arizona Game & Fish Department (AGFD), to ascertain if the area is indeed part of a pair's or unpaired pygmy-owl's home range. The FWS and AGFD shall cooperate expeditiously in their assistance in this effort.

In regard to determination that a pygmy-owl is detected within 600 meters of the property during the fall dispersal period, the Applicant, in cooperation with the FWS and AGFD, will make reasonable effort to determine if the pygmy-owl is establishing a territory. The 280-acre area centered on the known locations of the pygmy-owl will be considered a territory unless telemetry or other data indicate otherwise.

In the event that a territory is determined to exist without knowing the nest site location, then the center of the territory shall be determined based upon the centroid of known pygmy-owl locations. This shall be determined by plotting all known locations of the detected pygmy-owl on

then development/construction activities may proceed only under the circumstances described in the sections below.

Development Constraints - If an Owl is detected Prior to or During Development

The Applicant has incorporated into the proposed action specific conservation measures to guide development in the event that a pygmy-owl nest site or territory center is detected within 600 meters of the Project. Four zones are described (presented here as Zone I through Zone IV). These zones are based upon the distance of construction activity from a known nest or activity center. Certain levels of construction can occur within each of these zones without resulting in a situation that reaches the level of effect not already considered in the analysis of potential project impacts. Situations that fall outside of the parameters described in our October 23, 2000, *Biological Opinion on the Effects of the Dove Mountain Development in Marana, Arizona* (File number 2-21-99-F363), and that do not comply with the restrictions provided for in each of the zones described below, will require that the Applicant coordinate with FWS to determine if consultation is required prior to continuing with the construction activities in question. Specific development restrictions that apply to each of the four zones are described in the sections below.

ZONE I - 0-100 Meters from the Activity Center

- No additional clearing of vegetation will be permitted without authorization from us.
- Construction-related activities may continue on lands that have already been cleared of vegetation provided that they do not exceed the levels/intensity of activity that was occurring during the period of time that the territory was established.
- Activities that would be more intense or cause greater levels of noise disturbance than was occurring during the period of time that the territory was established cannot proceed without authorization from us.

ZONE II - 100-400 Meters from the Activity Center

- No additional clearing of vegetation will be permitted without authorization from us.
- No restrictions on the nature or type of construction activity (excluding the clearing of vegetation) from August 1st through January 31st of the following calendar year.
- Construction activities during the breeding season (February 1st to July 31st) cannot exceed the levels or intensity of activity that occurred at the time the territory was established.

available aerial photography or topographic maps. A minimum convex polygon shall be drawn around these known locations and the center of this polygon shall be considered the territory center. Points that do not reflect the regular pattern of movement exhibited by the individual and can be eliminated as "outliers" for purposes of determining the territory center if it is felt that including the outlying point(s) would unreasonably skew the results of the analysis. The location of an activity center will be based upon the best available scientific information. The FWS will make the final determination of this location based upon these data.

ZONE III - 400 to 600 Meters from the Activity Center

- No additional clearing of vegetation will be permitted without authorization from us.
- No restrictions on the levels or intensity of construction activity (excluding the clearing of vegetation) at any time of the year.

ZONE IV - Greater than 600 Meters from the Activity

- No restrictions – any activity consistent with the project description provided in the Biological Assessment is allowed.

Habitat Mitigation Plantings

Plants will be placed along new roadway culverts, behind the new Santa Cruz River bank stabilization, and along the realigned washes through Cortaro District Park. The location, density, and compensation of the planting areas is described in detail in the Biological Assessment.

Conservation Measures Specific to Each Project*Silverbell Realignment*

Conservation measures will be implemented as part of the upgrade and realignment of Silverbell Road to decrease the potential for adverse effects to any pygmy-owl or proposed designated critical habitat for pygmy-owls. The two major issues to be addressed are disturbance during construction and revegetation of areas adjacent to the road following completion of the project. Measures incorporated into the project design for reducing loss of vegetation and allowing for maximum restoration of the area to promote connectivity along potential pygmy-owl travel routes associated with drainages are described below:

- Limit vegetation clearing and removal of large trees to the extent practicable through mapping and site-specific design consideration.
- Designate boundaries for vehicular movement, keeping construction equipment within the disturbed ROW to prevent destruction and trampling of vegetation through the placement of t-post and wire fences at the limit of vegetation clearing prior to construction activities.
- Design the new culverts to reduce horizontal limits of each structure, and associated features to the extent possible, while keeping within safety guidelines.
- Design the vertical alignment of the roadway at the culvert to allow for a smooth transition back to existing roadway in the shortest distance possible.
- Complete revegetation along the slopes and ROW utilizing methods that are effective for establishing plantings in arid regions. Several mature trees will be planted on the north and south sides of each new culvert to provide connectivity of pygmy-owl habitat across Silverbell Road. If possible, plantings will be completed in the late fall to minimize stress on the plants and reduce the need for extensive irrigation.

Ina Road Upgrade and Bridge Replacement and Grade Control Structure

The loss of vegetation due to the Ina Road widening and replacement of the bridge at the Santa Cruz River will be minimized to the greatest extent practicable. The primary issue associated with this project involves impacts to riparian vegetation and wetland areas at the bridge crossing. Replacement of the bridge will result in the removal of several existing pier structures within the river and wetland area and the placement of additional supports for the two bridge structures. A portion of the Santa Cruz River adjacent to Ina Road will be dewatered during bridge removal and construction. Temporary structures will be placed upstream of the bridge site to divert flows around the site during construction, and flows will be returned to the original condition following completion of the bridge. During construction, conservation measures will be implemented to limit the area where construction vehicles are allowed to operate to the minimum necessary to conduct construction operations. In accordance with the Arizona Department of Environmental Quality 401 permit, a spill containment plan will be kept onsite and will be implemented in the event of a spill. Since the area is periodically scoured during flood events, and the wetland area and riparian habitats re-establish themselves, it is reasonable to assume that following construction of the bridge the area will be restored through natural processes.

Temporary impacts to wetlands and other waters would be mitigated as follows:

- Construction t-post and wire fencing will be placed along the temporary access roads to minimize the extent of surface disturbance.
- Recontouring and reconstruction of temporarily disturbed areas will include stockpiling the top 18 inches of wetland soils for restorative purposes and re-establishment of the preconstruction contours within the project area with stockpiled wetlands soils.

The roadway upgrade will be within the current ROW of Ina Road and will result in minimal loss of vegetation. Native vegetation will be planted along both sides of Ina Road within the 150-foot ROW along the length of the project. Irrigation will be provided to ensure the establishment of the plants. This vegetation will provide habitat elements that currently do not occur along Ina Road, enhancing opportunities for pygmy-owl and other wildlife to travel through the area.

Santa Cruz River Bank Stabilization

Bank stabilization will be installed along the west bank of the Santa Cruz River from Ina Road north to Cortaro Road. The top of the bank protection will be 50 feet wide and will provide for a 14-foot-wide pedestrian pathway. Of the remaining 36 feet of top width, 8 feet will be soil-cemented. Twenty-eight feet of top width will be vegetated with native plants for aesthetic and habitat-enhancement purposes. The proposed planting plan for this area will include planting trees with 20-foot centers for a total of approximately 335 trees. The trees and additional plantings of shrubs and forbs will be irrigated for two years. The area will be monitored, and plantings will be replaced if necessary. The tree canopy at maturity is expected to cover the entire 36-foot width of the non-paved top width.

Cortaro District Park

The project area is within proposed CHU-2, which has been identified by FWS as being important as a potential movement corridor for pygmy-owl providing connectivity between suitable habitat west and southwest of the project area and Critical Habitat Unit 3 to the northeast. There are several larger, well-defined, and deeply incised channels crossing the southern portion of the park site, while the drainages on the northern portion are less well-defined and braided. With consideration for the drainage pattern, Cortaro District Park was designed to provide for passive recreation in southern portions of the park and more intense recreation in northern portions. Passive recreation uses will encourage low-impact activities undertaken by individuals and small groups to reduce human activity and associated noise levels. This design includes the set-aside of much of the southern portion of the park as open space to maintain connectivity along the Yuma Mine Wash to the Santa Cruz River. Washes in the Cortaro District Park project area will be 100- to 200-foot-wide corridors and will be terraced to allow for plantings of native vegetation along the drainages. Native vegetation will be used and planted at densities sufficient to provide cover as supported by the FWS.

The acreage of land to be revegetated along the realigned washes totals approximately 6.2 acres. Passive recreation resulting in minor loss of trees will be located on approximately 5.9 acres on the southern portion of the parcel. This area is bounded by the revegetated wash areas, creating a corridor conducive to wildlife movement from the western side of Silverbell Road, along Yuma Mine Wash to the Santa Cruz River.

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 occur 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 (62 FR 10730) without critical habitat. In response to a court order, approximately 731,712 acres of critical habitat were designated on July 12, 1999 (64 FR 37419) 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 (67 FR 71032). 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 the FWS did not arbitrarily find the Arizona pygmy-owl population to be discrete, the FWS 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. On June 28, 2004, the District Court remanded, but did not vacate, the listing rule to us for further consideration.

Because conservation 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 (8 km (5 mi)) from nest sites and three of the four recovery team-recommended Special Management Areas (SMAs); 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-owl (67 FR 71032). When consulting with Federal agencies on projects that may destroy or adversely modify critical habitat, we evaluate the effects of their project on both the Unit and the-whole-of critical habitat. We can then 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 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. 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 migrate southward to warmer climates during the winter months.

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 manifested 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 that 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 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, 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*), western 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 that 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, Wilcox *et al.* 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, and should occur in an appropriate configuration in relation to the nest site.

Vegetation communities which 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.

Free-standing water does not appear to be necessary for the survival of pygmy-owls. During many hours of research and 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*, and *P. glandulosa*) 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 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 cat-claw acacia (*Acacia* spp.). Cacti of many species are found within this subdivision, and include many varieties of cholla (*Cylindropuntia*, spp.) and prickly pear (*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 sides 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.

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.

Over the past several years, pygmy-owls have also been found in riparian and xeroriparian (high bench and dry wash/arroyo) 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 along bottoms and washes.

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 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 have 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 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 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 1999).

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. Table 1 summarizes the numbers of pygmy-owls documented since 1993.

In addition, recent survey information has shown pygmy-owls to be more 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). 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 where possible.

The patchy, dispersed nature of the pygmy-owl populations in Arizona 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.

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
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

The ability of 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. One 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 was formerly (see below) reported to be 34.8 km (21.8 mi) (AGFD 2002b). 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 making long flights and may move up to 1.6 km (1 mi) or more in a night (Abbate *et al.* 1999). Trees of appropriate size and spacing may 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 which 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. A species can be listed if at least one of these five factors applies to the extent that the species is in danger of extinction throughout all or a significant portion of its range (“endangered” as defined in section 3(6) of the ESA), or likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range (“threatened” as defined in section 3(19) of the ESA). We determined that the following three factors applied to the pygmy-owl - Arizona DPS to the extent that endangered status is appropriate (FWS 1997).

Current Threats

The Arizona pygmy-owl DPS faces a number of threats, as detailed in the Final Rule listing the species as threatened (FWS 1997) and in the Draft Recovery Plan. Habitat loss and modification continues to be the primary threat to the species.

Pygmy-owls are capable flyers, but rarely make flights greater than 100 ft. (observational data from AGFD and FWS). 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, 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.

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 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.

Researchers in Arizona have found that pygmy-owls require habitat linkages, within and among home ranges, for movement and dispersal of young. Continuous cover or patches of trees and large shrubs spaced at close, regular intervals, to provide concealment and protection from predators and mobbing, as well as to provide shade and cool temperatures, is necessary (Abbate *et al.* 1999, Wilcox *et al.* 2000). Pygmy-owls, particularly juveniles because of their inexperience, are susceptible to predation, weather extremes, human-related injury/mortality factors (e.g., cars, buildings, fences, domestic cats, etc.) and other mortality factors (mortality of juveniles is typically 50% or more for owls and other raptors). Therefore, it is important to maintain habitat conditions that reduce their exposure to these threats and provide protection as they disperse from their natal areas. A high degree of cover throughout the landscape increases the likelihood of survivorship to the next breeding season. Limiting these mortality factors is important, especially for small, depressed populations, such as pygmy-owls in Arizona.

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). 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 increases 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. Given the low number of pygmy-owls in the action area, their potential isolation from source populations, the fact that inbreeding has occurred to the second generation in two documented cases, and potential pressure from urban development, there is a high level of concern for the Tucson Basin subpopulation of pygmy-owls.

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 (FWS 1997).

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. In the United States, pygmy-owls are rare and highly sought by birders, who concentrate at a few of the remaining known locations. 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 which 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.).

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*). Both 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). Therefore, cover near nest sites may be important for young to fledge successfully (Wilcox *et al.* 1999, Wilcox *et al.* 2000). Although nest depredation has not been recorded in Arizona, only a relatively small sample of nests have been monitored (n = 44 from 1995-2003). However, 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. The 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.

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, has 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 which 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 75 meters from a human residence. In 2001, predation by domestic cats is 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 constraints, complete information on the numbers or distribution 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 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) 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 territories, beyond those currently known, will be necessary, productivity must increase, and population support from Mexico or artificial augmentation is probably required. Currently, within the action area for this project, there are only three pygmy-owl sites that are known to be active, and all three contain only unpaired males. The immigration of one or more female pygmy-owls into this area is essential to maintaining this group of pygmy-owls and their contribution to the overall survival and recovery of the pygmy-owl in Arizona.

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). Pygmy-owls were detected throughout the state of Sonora, from the international border south to the Sonora/Sinaloa border. 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 (*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. In the not-so-distant future, pygmy-owls in Arizona may represent the majority of pygmy-owls occupying the Sonoran Desertscrub and Semi-desert Grasslands.

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 level of threats to habitat are reduced from those found in Arizona. Additionally, population numbers are higher and appear to be stable. 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 159 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 46 Federal agency actions have undergone formal section 7 consultation 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. However, only nonlethal take was authorized. 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 non-Federal projects (involving pygmy-owls), primarily single-family residences. 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 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 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).

This section includes repeated reference to areas within CHU-2 and CHU-3, which adjoin the action area. While the proposed action does not necessarily affect the entirety of the CHUs, it will occur in an area that could affect the future dispersal of pygmy-owls between them, which in turn is relevant to the conservation of the species in Pima County and points north and northeast. The discussion of the CHUs is included in the Environmental Baseline in order to frame the repeated references to them that appear in the subsequent Effects of the Proposed Action section.

The project site is roughly bounded by Silverbell Road on the west, Cortaro Road on the north, The Santa Cruz River on the east, and Ina Road on the south. In the Final BA, the applicant defined the action area as the aforementioned project site plus a 600-meter buffer area in which indirect effects could occur to a pygmy-owl if subsequently located in that buffer. We believe that the proposed action's indirect effects extend beyond the 600-meter buffer.

In recent consultations, we have sought to define action area based on the extent of the indirect effects resulting from the proposed action. These revised action area determinations included: (1) the area affected by increased traffic and other urban effects; (2) increased predation from subsidized predators and household pets, and domestic cats in particular; and (3) incremental, adverse changes to the geomorphology of the Tortolita Fan. The proposed action analyzed herein is likely only to exhibit effects described under Item 1, above; increased traffic and a changed nature of traffic flow due to the construction of the Cortaro District Park east/southeast of the intersection of Cortaro and Silverbell roads. The service area for the Cortaro District Park is stated in the BA to extend to a 2-mile radius from the facility. This two-mile radius encompasses an area of 12.6 square miles, or approximately 8,042 acres. We are aware that a circular description of the action area does not consider the linear paths taken by motorists. We feel, however, that effects occurring within the idealized circular service area are likely

comparable to those within an irregularly-shaped action area based on roadways and travel distances.

The presence and use of roads often degrades and fragments habitats, and given that such infrastructure is typically part of a network or system, the effects are often synergistic and widespread (Seiler 2001). Where such features are already present, as is the case with the proposed action, we must examine if there are likely to be any changes in the amount and timing of any traffic. It is reasonable to assume that the District Park will draw visitors from up to 2 miles that would not otherwise visit the largely-vacant property. It is also reasonable to assume that the improvements to Silverbell Road will accommodate, if not encourage, additional traffic.

One effect of the development of the District Park will be to increase traffic on Silverbell, Cortaro, and Ina roads within at least a 2-mile radius of the Cortaro District Park. The southern portion of the site is zoned Single Family Residential (R-6). Modifications to this zoning designation are not planned, but the project's proposed improvements to Silverbell and Ina roads will continue to accommodate future development of the site. Current use of these roads presents a mortality hazard to pygmy-owls; increased use therefore presents an incrementally-increased hazard. Furthermore, the proposed action will widen Silverbell Road to four lanes, including a continuous left-turn lane, shoulders, and sidewalks. The design does not incorporate a vegetated median that has been incorporated elsewhere to permit continued use as a dispersal corridor. Lastly, the risk of vehicle-strike mortality is likely related to the number of vehicles using the road; a greater number of vehicles, a greater frequency of use, and/or a higher design speed can reasonably be expected to increase the probability that a pygmy-owl will be struck. Given the pygmy-owl's rarity and patchy distribution, any vehicle strike mortality could have serious adverse consequences to a regional subpopulation. As such, the action area thus must include all pygmy-owl territories and dispersal corridors intersected by those roads within 2 miles of the proposed action that are likely to be affected by the incremental increases in vehicular traffic from the District Park.

Within two miles, these arterial routes cross the 600 meter radii of three (3) known past or present pygmy-owl home ranges within CHU-3 to the east (S. Richardson, pers. comm.). The routes also cross the average 5-mile pygmy-owl dispersal routes from an additional two (2) known past or present home ranges not intersected by the aforementioned roads within a 2-mile radius. These home ranges and dispersal routes are all contained within CHU-3, the viability of which is tenuous due to the rarity of pygmy-owls within it. All three known pygmy-owls in CHU-3 are male. One avenue for females to disperse into CHU-3 is from western and southwestern locations within CHU-2.

The direct and indirect effects resulting from this project include those within the action area as well as the effects of incrementally increased traffic within a 2-mile radius. On-site construction will alter vegetative characteristics and increase the flight distance over Silverbell Road. These effects influence the viability of proposed CHU-2 and CHU-3 and any pygmy-owls presently occupying those units. The effects to these critical habitat units are key in our evaluation of whether this project will jeopardize the species or adversely modify proposed critical habitat.

Therefore, while the action area for this project is limited to the 2-mile radius service area, the effects on pygmy-owls' ability to disperse between CHUs 2 and 3 will be considered in the Effects of the Proposed Action section, below. The area adjacent to the action area includes 16 known pygmy-owl home ranges (15 in CHU-3, one in CHU-2) and intersects dispersal habitat and known dispersal pathways for these same pygmy-owl home ranges. Critical habitat was proposed based on pygmy-owl occupancy status and/or their contribution to habitat connectivity and habitat availability needed for population expansion. Effects on the past and current function of these areas have occurred as a result of capital improvement projects, residential and commercial development, and agricultural activities. In particular, these activities have affected the amount of available pygmy-owl breeding habitat and have resulted in loss of habitat connectivity and increased fragmentation. Remaining areas of pygmy-owl habitat connectivity through the action area are very important. The following discussion further elaborates past and ongoing effects on these units within the action area.

The action area and adjacent CHUs 2 and 3 are situated within the paloverde-cacti-mixed scrub series of the Arizona Upland Subdivision of the Sonoran Desertscrub community. These areas are also characterized by existing and ongoing urbanization, which has had the effect of removing and fragmenting suitable pygmy-owl habitat. During the past three years, we completed 13 formal section 7 consultations and 69 informal section 7 consultations within CHU-3 alone (e.g., planned residential, commercial, and other developments) and have provided technical assistance to hundreds of individuals seeking to develop single-family residences on individual lots and other non-Federal projects. There are also many projects, primarily single-family residences, where we do not have the opportunity for input. We are aware of at least three commercial projects and two residential projects, occurring within CHU-3 and adjacent to the action area, where clearing of vegetation occurred without our input. All of these projects, combined with existing development, contribute to habitat fragmentation and reduce available habitat in the immediate vicinity of this project. Areas large enough to provide for successful breeding and dispersal are essentially east and southeast of this project and dispersal corridors to the south are limited. A second, major connection for dispersal exists north of the proposed action where CHUs 2 and 3 meet along the Santa Cruz River in southern Pinal County. This more-northern connection will not be affected by the proposed action.

Dove Mountain and Heritage Highlands, together covering close to 5,600 acres, are mixed-use developments located to the east/northeast of the project parcel. Consultation was conducted for a portion of Dove Mountain and a portion of Heritage Highlands, and actions are being implemented to reduce effects on pygmy-owls. However, approximately 97 acres of the Heritage Highlands project has been or is being graded and developed without undergoing section 7 consultation. The Section 36 development project is situated south of the aforementioned large developments, and construction is beginning on up to 172 acres of the 598 acres of habitat in the project site. These residential, commercial, and golf developments have removed areas of habitat and contribute to habitat fragmentation, but have also set aside habitat areas that are suitable for dispersal and breeding. Another development proposal, Sky Ranch, developed a Habitat Conservation Plan (HCP), and was issued a section 10 permit covering over 500 acres of pygmy-owl habitat adjacent to the Section 36 development. While this development is being planned to reduce effects on pygmy-owls, the clustered development will result in further

fragmentation of the landscape, but will provide permanent conservation of certain nesting, foraging, and dispersal habitat.

In March 2002, we completed consultation with the EPA on a 100-acre residential development (Butterfly Mountain), also in the same area as the above projects. Butterfly Mountain will result in approximately 17% surface disturbance, but will retain potentially suitable nesting, foraging, and dispersal habitat. A number of project proponents have submitted development proposals to us for the area north and west of the proposed project, but they have not entered formal consultation.

There has been a concentration of projects affecting pygmy-owls to the east/northeast of the project area. In July 2000, we completed a consultation with the EPA on a 20-acre residential development (Countryside Vistas Blocks 5 and 6). In December 2000, we completed a consultation with the EPA for a 29-acre residential development (Tecolote de Oro). In July 2001, we completed a consultation on the 7-acre Crescent Ridge Apartments. In December 2001, we completed two consultations with the EPA: a 7.86-acre project for Mountain View High School, and a 141-acre residential development (Hartman Vistas). In February 2002, we completed a consultation with the EPA on improvements to Thornydale Road which removed 9 acres of suitable habitat. In April 2002, we completed consultation with the EPA on a 150-acre residential and commercial development (Chaparral Heights). These projects are situated within the 34.8 km (21.8 mi) (AGFD 2002b) known dispersal distance of the pygmy-owl.

While none of the above actions rose to the level of jeopardy, non-lethal take of one or more pygmy-owls was anticipated on four of the above projects. Additionally, the two existing HCPs within the vicinity of this project also authorize non-lethal "take" of pygmy-owls. Previously authorized "take" of pygmy-owls in the areas east of the action area proper results in an analysis framed by a potentially diminished pygmy-owl population baseline with CHUs 2 and 3. It is clear that portions of the action area for this project are experiencing ongoing loss and fragmentation of habitat that may affect the pygmy-owl throughout northwest and western Tucson. This trend is expected to continue. Some of these activities have had a Federal nexus that resulted in consultation with us. As a result, we have been able to recommend modifications to activities that would block potential movement or dispersal corridors and permanently set aside either on-site or off-site conservation lands that are beneficial for the survival and recovery of the pygmy-owl. However, as mentioned above, there are many projects, some relatively large and in crucial locations, where we have no opportunity to provide conservation recommendations. Since 1999, we are aware of nine projects within the CHUs bordering the action area, totaling approximately 900 acres, that have received Federal permits, but removed suitable pygmy-owl habitat without undergoing section 7 consultation.

As described above, portions of the 2-mile radius action area are reasonably certain to continue to experience effects from the construction of community facilities and road improvements will continue to contribute to the loss and fragmentation of pygmy-owl habitat within the action area and in the CHUs that bracket it. Trends in urbanization and development within the action area are further described in more detail within the Cumulative Effects section of this BO.

The site of the proposed action is situated west and south of a contiguous block of several thousand acres of State Trust, including approximately 2,400 acres (Tortolita Preserve) leased for pygmy-owl conservation purposes as part of the Dove Mountain development project. The portion of the action area and adjacent lands defined by the effects of increased traffic on Cortaro Road lies south of these State lands. Existing development and development proposals in the eastern part of the action area are more extensive than in the western part. However, State Trust lands may be sold or exchanged and could be used by future owners for development. The extent of development and the ability to address effects on pygmy-owls on State Trust lands depends on if they are sold or exchanged, the type of development proposed, and the presence of a Federal nexus. Presently, State Trust lands are being leased for grazing. Other activities (e.g., recreational off-road vehicle [ORV] use, shooting/target practice, hunting, etc.) also occur on these lands. Of more consequence is the fact that the area between these State Trust lands and the project is developed and fragmented, and the opportunity for pygmy-owls to disperse into these currently undeveloped lands is already diminished. We are further concerned that the proposed action will reduce the dispersal corridors for the three known pygmy-owls in CHU-3 and the low density development, specially-managed conservation lands (Tucson Mountain Park, Saguaro National Park and potentially, the Sweetwater Preserve), and State Trust and Public Lands in the Avra Valley to the west.

The Recovery Team has prepared a draft recovery plan dated January 2003 for the pygmy-owl (Draft Recovery Plan) and recommended "Recovery Areas" that they believe are necessary for the survival and recovery of the pygmy-owl in Arizona (USFWS 2003). With regard to this project, all areas are within recommended Recovery Area 2, and the effects range into Recovery Area 3. The team also has recommended specific areas within Recovery Areas for special management (i.e., SMAs) that are of the highest concern because: (1) they contain a high concentration of pygmy-owls, particularly nesting pygmy-owls, that are important sources of young pygmy-owls to increase the population; (2) pygmy-owl recovery is dependent on the availability of suitable habitat near breeding areas not currently known to have pygmy-owls where juvenile pygmy-owls can disperse into and successfully breed; and (3) they are threatened by rapid urban development or other immediate threats. Within and adjacent to the action area (CHU-2 and CHU-3), two SMAs have been recommended by the Recovery Team: (1) Northwest Tucson SMA – located generally north of Cortaro Farms Road, south of the 136000 N street alignment, east of Interstate 10, and west of La Cholla Blvd; and (2) Tortolita Fan SMA – containing major washes and upland corridors connecting the Northwest Tucson SMA to southern Pinal County. The project site falls within the Northwest Tucson SMA, but its effects range into the Tortolita Fan SMA.

The draft Recovery Plan states, "Because of the significance of habitat within SMAs, development within these areas should be subject to more detailed analyses. Specifically, consideration should be given to spatial needs, breeding requirements, dispersal patterns, home range and landscape-level movement requirements, and habitat conditions needed for foraging and predator avoidance. These considerations and levels of disturbance should be evaluated at the project level and implemented in a manner that disturbs the least amount of the highest quality pygmy-owl habitat within a project area and results in habitat being distributed in a uniform and connected fashion across the landscape. Additional disturbance, beyond the footprint of construction, from lights, noise, and traffic, should be considered during the

assessment of large projects. Implementation of this guideline should also strive to maintain, where possible, relatively large blocks of nesting habitat and, as noted above, habitat for the movement of pygmy-owls within and among Recovery Areas. Maintaining adequate habitat for dispersal and nesting in proximity to known nest sites is needed for expanding, maintaining, and establishing subpopulations that are essential to the long-term maintenance of pygmy-owls in Arizona". "We also suggest that relatively high conservation values be placed on areas within SMAs that are deemed especially important for maintaining habitat or movement corridors for pygmy-owls (e.g., the southern portion of the Northwest Tucson SMA)" (USFWS 2003). The proposed action is situated within 2 miles of the High-value Conservation Area established in the draft Recovery Plan (USFWS 2003).

As discussed above, the action area for this project is characterized by a mix of residential, commercial, and resource-based development. Recent and proposed projects indicate that these types of developments are continuing within the action area. The current landscape in the vicinity of the proposed project has few large areas of undisturbed, natural desert, and connected pathways of habitat are limited. Existing conditions within the action area are characterized by natural open space that has been whittled down to a few, scattered parcels, representing a small-scale model of the overall condition of the urbanized portions of CHUs 2 and 3. As a result, any loss of or impacts to these few remaining areas of natural desert are likely to have significant impacts on the ability of pygmy-owls to persist in northwest Tucson. Observations indicate that pygmy-owl movements in this area are tied to remaining open areas. Impacts affecting the ability of pygmy-owls to utilize these remaining open areas will result in substantially reduced opportunities for pair formation and breeding.

In 2004, only a few pygmy-owls (three adults) were known in CHU-3 within and east of the action area. These same three pygmy-owls are the only pygmy-owls confirmed in northwest Tucson in 2004. The project site is west of these home ranges. All of the known "northwest Tucson" pygmy-owls are males, increasing the vulnerability of this group of pygmy-owls to extirpation. Monitoring has indicated that a dispersing female pygmy-owl moved from south to north within the Avra Valley. The total distance traveled by that owl was at least 160 km (100 mi) (Abbate pers. comm.) and she was last detected southwest of Casa Grande, well north of the project area. These observations indicate the female pygmy-owl was capable of reaching and potentially dispersing through the action area. This emphasizes the absolute necessity to facilitate and enhance the immigration of pygmy-owls into the action area to breed and disperse; particularly to enhance the pairing of known single males. The project vicinity has a history of consistent use by pygmy-owls. The most productive pair of pygmy-owls documented in Arizona to date occupied a site several miles east/northeast from this project, from 1995 through 1999. A second home range east of the project has been occupied since 2000. Another nest site, which produced young as recently as 2002, is located within 10 miles of the project. Four additional nest sites are located within 20 miles of the project site. The other two currently occupied sites fall within 10 miles of the project, as well. Documented juvenile dispersal pathways are located north of Cortaro Farms Road, east of the project. Dispersing juveniles were tracked using these pathways in 1997, 1998, 1999, 2000, and 2001.

From 1999 to 2002, the area intersected by and overlapping with the action area (to the east) accounted for approximately 30% of the documented adult pygmy-owls and 40% of the

documented nests in Arizona (Abbate *et al.* 1999, 2000, AGFD 2002a). Given the substantial proportion of the statewide documented pygmy-owl population that this represents, we believe the pygmy-owl habitat and dispersal corridors found within the action area are important for the survival and recovery of the pygmy-owl statewide.

Effects of the Proposed Action

The proposed action consists of four elements: (1) the realignment of Silverbell Road; (2) the replacement and widening of the Ina Road bridge, including the grade control structure; (3) the installation of bank protection in the Santa Cruz River; and (4) development of the Cortaro District Park. Each of the four projects will result in some loss of vegetation, though a portion of that loss will be minimized through on-site retention/transplantation and revegetation with native species. Vegetation loss associated with each of the roadway projects is directly associated with widening the roads and ROW acquisition. The BA includes the following description of impacts, which we have edited to include additional analyses of effects:

- The Silverbell Road portion of the proposed action will involve realignment of two curves and will affect 6.32 acres of presently-undisturbed areas; however, 1.42 acres of the existing alignment just north of the intersection with Ina Road will be revegetated after the roadway is realigned; therefore, there will be a net loss of 4.9 acres. The flight path for a pygmy-owl attempting to cross the realigned road will be increased from the present FWS-estimated 75 feet to a design width of 150 feet. The washes that will be realigned and conducted through culverts beneath Silverbell Road will be revegetated and/or enhanced, with additional plantings established on the facets of earth immediately adjacent to the ROW.
- Much of the shoulder area adjacent to Ina Road is currently devoid of vegetation; therefore, loss of potential pygmy-owl habitat along the Ina Road alignment is minimal. New ROW acquisition for the horizontal shift of the road will result in disturbance to approximately 1.3 acres of habitat. The proposed planting plan for Ina Road is expected to result in an improvement in vegetation community composition and structure over the current situation.
- Much of the 48-acre park site will be developed for recreational uses as well as facilities including the library and community center. The northern approximately 40 acres of the park will be fully developed, and revegetation will be restricted to landscaping around the buildings. This area will be rendered unsuitable for pygmy-owl dispersal. The southern approximately 8 acres will be used for less-structured use. This southern portion will include approximately 6 acres of natural open space and an equestrian staging area and parking lot. The washes traversing west to east across the property will be revegetated along adjacent terraces to maintain the functions and values for habitat and storm water conveyance. These lateral features are expected to provide a modicum of pygmy-owl connectivity across the park site. Development of the park will result in a net, permanent loss of approximately 41 acres of dispersal habitat.
- Installation of 1.4 miles of bank stabilization will result in the initial loss of 24.64 acres of land, much of which is currently devoid of vegetation suitable for pygmy-owls. At the southern portion of the revetment, 11.87 acres of this total is temporary loss of vegetation associated with erosion control on the west side of the structure due to the presence of a deep pit. This area will be revegetated. The magnitude of habitat loss could be further reduced if

the conceptual planting plan discussed in our June 9, 2004, meeting with the Town of Marana and Westland, whereby the margins of the culvert exit structures are revegetated, passes engineering design muster. The remaining 12.77 acres of this disturbance is attributed to the 50-foot-wide pathway along the top of the revetment. Native plants will be located on the top of the 50-foot-wide revetment, with the exception of a 14-foot-wide pedestrian pathway, which results in the permanent loss of 1.7 acres.

The individual and aggregated acreages affected by the four elements comprising the proposed action appear in Table 2, below.

Project Element	Permanently Affected Acres	Percent of Proposed CHU-2 (179,805 acres)
Silverbell Road	4.9	.003
Ina Road Bridge	1.3	0.0007
Bank Stabilization	1.7	.0009
District Park	41.0	0.02
TOTAL	48.9	0.025

We anticipate that the proposed action will not result in the loss of pygmy-owl nesting or foraging habitat, as the vegetation that would support such activity is currently limited in extent on-site. We are concerned, however, with the increased capacity, 50 mph design speed and 150-foot ROW for Silverbell Road and its contribution to habitat fragmentation. The pygmy-owl's perch-and-glide flight style renders the bird less able to cross wide expanses. The placement of the largest salvaged trees and establishment of the largest-growing species from the revegetation palette as close to the ROW as possible will permit pygmy-owls to glide from a higher perch; Fleisch (2003) considered perch height relevant to calling site selection and it may be similarly important during dispersal. While the effects of increased flight distance across Silverbell Road are partially minimized, we anticipate an increased risk of vehicle strikes. The additional lanes are expected to accommodate additional traffic. The high speeds attained by automobiles are likely to render motorists incrementally less likely to see and safely evade pygmy-owls crossing their path.

The action area intersects or lies within the Northwest Tucson SMA identified in the draft Recovery Plan. The Recovery Team recommends that areas within SMAs be conserved in a manner that promotes the successful breeding and dispersal of pygmy-owls. The specifics of how that is to be accomplished should rely upon the best available scientific data. Currently, the best information regarding the amount of development occurring in successfully breeding pygmy-owl home ranges comes from data being gathered by the AGFD. In home ranges (estimated to be 280 acres in size) where successful nests have been located, disturbance ranged from 16% to 54% with a mean of 33%. There are limitations to the data on which these numbers are based such as

the small sample size, the limited number of years over which these data have been gathered, and the absence of data qualifying the disturbance types. However, it represents the best information upon which we can currently base our analysis. The effects of the proposed action, however, occur within a mosaic of suitable and unsuitable habitat and therefore do not lend themselves to this method of quantifying effects.

Surveys for pygmy-owls were conducted on the project in 2001, 2002, 2003, and 2004. On July 17, 2001, we granted an exemption from the need to survey the Ina Road alignment due to the high level of disturbance and low habitat value in that area. No pygmy-owls were detected during these survey efforts. A cluster of pygmy-owl detections occurred in 1994 through 1996 to the east/northeast of the project area south of Tangerine Road along Camino de Mañana. A pygmy-owl was detected northeast of the Camino de Mañana/Tangerine Road intersection in 1995, and there was a detection north of Tangerine Road and west of Tortolita Drive in 1999. These detections are within CHU-3, intersected and adjacent to the action area, but we do not believe that this project will directly affect a known breeding site for the pygmy-owl. However, if a pygmy-owl does, in the future, establish a territory on or adjacent to the project site, the project proponent will implement measures to avoid direct effects including the application of adequate conservation measures as defined above in the subsection entitled Development Constraints – If an Owl Shows Up (Final BA: Section 3.3.2) to ensure noise disturbances will not cause the pygmy-owls to abandon their nest or activity center and a sufficient amount and configuration of suitable habitat will be protected within their territory for it to remain viable for pygmy-owls.

There is a reasonable likelihood that juvenile pygmy-owls may disperse through the project site during construction of this development because: (1) there are active nest sites within the known dispersal distance; and (2) the project site contains and will enhance dispersal corridors. Dispersing pygmy-owls typically move greater distances during the dispersal period, ranging several miles and over wide areas before selecting a territory, where they will remain throughout the remainder of the fall and winter. The temporary loss of riparian vegetation in the Santa Cruz River channel and the 150-foot right of way will compromise the site's ability to support dispersal between CHUs 2 and 3, however, recovery of riparian vegetation and enhancement of portions of the park site and east-west channels will minimize the adverse effects.

There are also a number of potential indirect effects on pygmy-owls that could result from the development of this project. For example, mortality risks associated with pest control, pollution, collisions with cars, radio towers, glass windows, power lines, and cat predation are often underestimated, although likely increasing in occurrence due to human population growth (Banks 1979, Klem 1979, Churcher and Lawton 1987). Even where human-related deaths are uncommon, they may still substantially affect populations of rare birds (Cartron *et al.* 2000a). Because of the proximity of pygmy-owl sites to residential areas in northwest Tucson, these interactions may be a significant cause of pygmy-owl mortality there (Cartron *et al.* 2000a). Given the pygmy-owl's rarity and patchy distribution, any vehicle strike mortality could have serious adverse consequences for the long-term persistence of pygmy-owls in northwest Tucson because there are only three known individuals at this time.

The effects that non-directional and high-intensity lighting have on pygmy-owls are unknown. Lighting is expected to increase substantially within the park area; however, it is not quantified in the BA. Of particular concern is high-intensity lighting in close proximity to pygmy-owl nests, activity centers, and movement corridors. Increased exposure to predation of adult pygmy-owls and fledglings may occur from great horned owls and other predators where bright lights are used near pygmy-owl sites. If low-intensity and directional lighting is used to reduce the exposure of pygmy-owls to predation in these areas, adverse effects would be substantially reduced or eliminated.

The proposed action could also cause short-term noise disturbance associated with construction and long-term noise disturbance and increased human activity. In the event a pygmy-owl were present, it is possible that such noise disturbance would affect the pygmy-owl directly by altering behavior and, indirectly through potential increases in predation, effects on prey species, etc. However, these effects have not been quantified during research on pygmy-owls. The project proponent will implement the development constraints discussed in this document related to activities in proximity to pygmy-owls on and adjacent to the project. This should reduce the effects on pygmy-owls from noise and disturbance related to construction activities associated with this project.

Proposed Critical Habitat

The project area falls within the 158,361-acre CHU-2 and is adjacent to the 74,193-acre Unit 3 of the proposed critical habitat for the pygmy-owl (U.S. Fish and Wildlife Service 2002). The primary constituent elements (PCEs) related to dispersal habitat and defined in the proposed rule designating critical habitat are found within the action area. These dispersal-related primary constituent elements will be eliminated on portions of 48.9 acres of land within the project boundaries. This equals approximately 0.025% of Critical Habitat Unit 2. However, the actual percentage of critical habitat removed is somewhat higher since not all areas within the boundaries of critical habitat contain primary constituent elements (U.S. Fish and Wildlife Service 2002). Moreover, the effects of the proposed action extend any pygmy-owl attempting a southern ingress or egress of CHU-3, as the project is situated in a corridor linking the two proposed CHUs. The conservation measures described above and in the BA should maintain the function and viability of proposed critical habitat in CHU-2 and 3.

Summary

Based on the current status of the pygmy-owl in Arizona, survival and recovery of the pygmy-owl will likely require not only protection of all known sites, but also the conservation of other areas not currently known to have nesting pygmy-owls. This can be measured at two spatial scales. At a large scale, connectivity is necessary among large blocks of suitable habitat that are either currently known to have nesting pygmy-owls or are important for recovery. Critical Habitat is explicitly related to recovery. This project contains measures to ensure that connectivity between CHUs 2 and 3 is maintained. At a finer scale, the protection of habitat within the vicinity of known pygmy-owl sites for establishment of new sites and movement between them is also essential. The Northwest Tucson SMA accounts for a substantial proportion of the documented pygmy-owls and nests in Arizona. It also contains habitats not currently

known to have nesting pygmy-owls that are likely important for the expansion of the population within the action area. This project lacks appreciable amounts of nesting habitat, but the restoration of a portion of the park site is expected to make an incremental contribution to fine scale movements of pygmy-owls.

The Silverbell Road improvements, Ina Road bridge replacement and widening, Cortaro District park development, and placement of bank protection in the Santa Cruz River bed will permanently remove approximately 48.9 acres of habitat, some of which is suitable for dispersal. More crucial than the amount of dispersal habitat removed, however, is the configuration of the dispersal habitat that will remain after completion of the proposed action. While we remain concerned with the new, 150-foot flight distance over Silverbell Road, the effects will be partially minimized through vegetation size (for transplants) and species selection (for revegetation). The revegetation and enhancement of Yuma Mine and other, unnamed washes west and east of Silverbell road will add further connectivity, as will restoration of the southern park property and the anticipated riparian recovery within the bed of the Santa Cruz River.

Cumulative Effects

Cumulative effects include the effects of future State, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this draft 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 action area includes the 8,042-acre service area (2-mile radius) for Cortaro District Park within CHU-2, though the analysis of effects did consider the biological relevance of cumulative effects dispersed throughout CHUs 2 and 3.

The action area contains at least one parcel zoned as Single Family Residential (R-6). Adjacent areas are also subject to ongoing residential and commercial development pressures, and State, local, and private actions are expected to continue with various levels of development immediately to the south and east and, to a lesser extent, northwest of the project site and elsewhere in the action area. Activities occurring within jurisdictional waters and wetlands of the U.S. require a section 404 permit under the Clean Water Act from ACOE and, as a result, would be subject to future section 7 consultation and are not considered under cumulative effects. The Final BA for this project included partial information regarding cumulative effects.

We also were provided with information regarding cumulative effects in the region containing the action area during consultation on the development of Section 36 in Township 11 North, Range 12 east, in Marana. The data provided under the prior consultation included information and statistics concerning zoning and development levels within the portion of the action area proposed as critical habitat. We considered that information during our analysis of cumulative effects, and utilized those portions of that information that we deemed to be determinative.

In the past, any activity clearing five acres or more required a National Pollutant Discharge Elimination System (NPDES) section 402 permit under the CWA from the EPA. However, the NPDES program was recently transferred to the State of Arizona Department of Environmental Quality (ADEQ) and, as a result, projects requiring such a permit will no longer have a Federal

nexus if the project does not require a permit from the ACOE. Many of these projects that were not formerly considered under cumulative effects because of their Federal nexus and section 7 process now need to be included in this analysis. Some of these projects may address effects on pygmy-owls through another process (Habitat Conservation Planning under section 10 of the ESA) and could be excluded from this cumulative effects analysis, but such participation is voluntary. Aside from HCPs already in development, it is difficult, if not impossible, to predict which parcels may choose to pursue an HCP. Therefore, the scope of this cumulative effects analysis covers all activities not likely to require a 404 permit from the ACOE. It must also be noted that avoidance of jurisdictional waters may preclude the need to obtain a 404 permit, thus removing a given project's Federal nexus.

The action area and surrounding lands have been subject to significant development activities, and while development will likely continue at some level, there have been a number of recent lower-density developments proposed, such as Butterfly Mountain and Saguaro Canyon Ranch. In addition, some development projects have chosen to cluster development at higher densities, leaving larger blocks of undisturbed desert and wash vegetation (Dove Mountain and Sky Ranch). The preceding four development projects did possess a Federal nexus for consultation under the Act, and are included herein only to illustrate the manner in which other, non-Federal actions could reduce the magnitude of their cumulative effects on pygmy-owls.

Some areas suitable for residential construction have been down-planned (recent plans recommend lower density development than previous plans), but build-out at these lower densities is dependent on a number of factors including market, existing zoning, and intentions of the landowner. Much of the private land in the area is zoned for low-density residential uses that would have reduced effects on the pygmy-owl. However, past development has often occurred on parcels with low-density zoning that was rezoned to a higher density. Based on projects with which we are familiar, this trend is likely to continue, but probably to a reduced extent.

The Baseline Conditions describe an action area that is already developed and fragmented, primarily in the area to the southeast of this project. As a result, any additional loss or fragmentation of pygmy-owl habitat may affect the species' ability to persist on the landscape. So while surrounding development trends, zoning, and planning are beginning to provide a scenario where cumulative effects may be reduced, any cumulative effects, particularly in the areas east and northeast of the project site, may still have a considerable effect on the pygmy-owl. Many small, undeveloped parcels used primarily for single-family dwellings will not require a Federal permit or other Federal nexus and will continue to be built without section 7 consultation.

This is particularly important in the action area due to the undeveloped parcel zoned as SR that, if developed, will further reduce the amount of suitable habitat, increase fragmentation, and degrade habitat conditions within the southern corridor between CHUs 2 and 3. Since 1999, we are aware of nine projects within areas adjacent to the action area, totaling approximately 900 acres, that have received Federal permits, but removed suitable pygmy-owl habitat without undergoing section 7 consultation. These projects could be considered as having cumulative effects based on the lack of section 7 consultation.

As stated in the Environmental baseline section, the project area, action area, and surrounding region, taken together, support one of the highest documented concentrations of pygmy-owls in the State. We are aware of a number of potential residential and commercial developments, schools, churches, etc. in the action area that may further reduce and fragment pygmy-owl habitat in this area. Some of these projects may not be reasonably certain to occur based on our section 7 guidelines, but the development history of this area and apparent trends indicate that there is a likelihood that they will.

We reiterate that analyses of trends in growth frame the scope of cumulative effects but do not necessarily define those actions that are reasonably certain to occur. There exist, however, certain incremental actions and approvals in the planning and zoning process that do contribute certainty to our analysis of cumulative effects. These actions include existing zoning, land-use designations within jurisdictional comprehensive plans, transportation plans, population projections, rezoning requests, development plans, plat submittals, and grading and building permit application and approvals. It may be reasonably assumed that these actions, when considered in the context of recent trends, can give us a clear picture of the potential for cumulative effects that are reasonably certain to occur.

As discussed in the Environmental Baseline section of this biological opinion, the general trend for the action area and surrounding lands is for increasing residential development. Not all of this growth occurs within the action area, nor are pygmy-owls affected by all growth. However, within Marana, growth increased 52% between 2000 and 2003, compared to only 8% for Pima County as a whole (PAG 2003). As described above, portions of the action area are and are highly likely to continue to experience effects from urbanization. New housing construction, and its associated commercial developments and capital improvements, will continue to contribute to the loss and fragmentation of pygmy-owl habitat within the action area. It is likely that the proposed action itself is the result of such growth.

Within the lands adjacent to the action area, land ownership falls into two primary categories, private lands and State Trust lands. Much of the private land has already been developed and the remaining undeveloped private lands can be reasonably expected to be developed. The State Land Department has identified Trust lands along Tangerine Road, Thornydale Road, and Camino de Mañana as suitable for commercial and medium-density residential development (includes uses as intense as apartments) (ASLD 2000), indicating that State Trust Lands are likely to affect pygmy-owls and their dispersal habitat within the action area. However, there is also the potential for these lands to contribute to the conservation of important pygmy-owl habitats.

Private lands adjacent to the action area have five jurisdictional approvals or designations that indicate continued development is reasonably certain to occur. We have searched the land use and zoning designation for Marana and Pima County for the action area. In light of documented trends and based on the existing zoning, submitted development plans or subdivision plats, transportation plans and development impact fee areas, we have determined that projects affecting pygmy-owls and pygmy-owl habitat, without a Federal nexus, are reasonably certain to occur at the following areas: Cortaro Road/Thornydale Road intersection, Tangerine Road/Thornydale Road intersection, Hardy Road/Thornydale Road intersection, Heritage

Highlands development area, Tangerine Road/Camino de Oeste area, Camino de Mañana/Linda Vista area, and single-lot residential development throughout the area east of the action area. Proposed development is of both commercial and residential development categories.

These cumulative effects will contribute to habitat fragmentation because most occur adjacent to roadways and will increase the linear extent of unsuitable habitat across the action area. The areas where we anticipate cumulative effects to occur support known breeding home ranges for the pygmy-owl, as well as dispersal habitat and pathways. This will reduce available pygmy-owl breeding habitat, and will also reduce habitat connectivity and the opportunity of pygmy-owl movements through the action area. However, the majority of the outlined cumulative effects will occur south and east of the action area, some distance from the proposed project. Because of the conservation measures outlined in the proposed action, we do not anticipate that the project will expand or exacerbate the identified cumulative effects.

Conclusion

After reviewing the current status of the pygmy-owl, the environmental baseline for the action area, the effects of the proposed project, and the cumulative effects, it is our biological opinion that the proposed action is not likely to jeopardize the continued existence of the pygmy-owl. The Silverbell Road realignment, Ina Road improvements, bridge replacement and widening, Ina Road improvements, Cortaro District Park, and Santa Cruz River bank protection project occurs within proposed critical habitat (CHU-2) for the pygmy-owl, and the effects reach into CHU-3; however, the application of conservation measures described above help minimize the effects of the action, and it is our conference opinion that the proposed development is not likely to result in the destruction or adverse modification of proposed critical habitat.

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 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 sample size is low and the monitoring period short, available data suggest that there may be a declining trend in population that has somewhat corresponded with recent drought conditions. However, in and around the action area, drought should not have such a marked effect due to artificial water sources, enhanced vegetation, and increased prey availability. However, numbers of known pygmy-owls within CHU-3 have declined from a high of 11 in 2000 to only 3 in 2004. Unpublished, anecdotal observations by researchers in Mexico indicate a similar population decline just south of the U.S. Mexico border (A. Flesch, pers. comm.).

Proposed CHU-2 and CHU-3, including the action area, have been subject to rapid growth and urbanization. Existing natural habitats have been lost and fragmented. While some recent development projects have utilized lower housing densities or clustered development, many of the residential subdivisions being developed are high density (4 to 6 houses/acre). Many of the roads in the action area are slated for expansion or improvement, and at least one new highway interchange is under development. Some sites within CHU-3 have been designated for pygmy-owl conservation as a result of completed section 7 consultations.

With the recent EPA transfer of the section 402 CWA NPDES program to the State of Arizona, the number of projects with a Federal nexus has been reduced within CHU-3. Single-family residence construction typically does not have a Federal nexus. Cumulative effects considered in our analysis include 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 pygmy-owl breeding home ranges and dispersal pathways have been documented. Cumulative effects are likely to continue to further fragment habitat.

The Applicant has included a number of conservation measures that will meaningfully reduce the effects of the proposed action on pygmy-owls and on proposed critical habitat by: (1) minimizing noise and vegetation disturbance if a pygmy-owl is detected on the project site prior to and/or after commencement of construction, reducing the extent of direct effects; (2) maintaining habitat connectivity by enhancing washes and establishing vegetation to minimize vehicular mortality of pygmy-owls crossing Silverbell Road.

In summary, our conclusions are based on the record of this consultation including the initial and final BAs, correspondence and meetings with the project proponents, and the information outlined in this biological opinion. The pertinent points are summarized below:

1. The project site is not believed to be within a known territory of a pair or individual resident pygmy-owl, therefore the likelihood of lethal take is minimal.
2. Conservation measures will be implemented to minimize noise and vegetation disturbance if a pygmy-owl occupies the project site prior to and/or after commencement of construction, reducing the extent of direct effects.
3. Conservation measures will minimize the indirect effects of this development on pygmy-owls.

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 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.

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

Amount or Extent of Take Anticipated

We do not anticipate the proposed action will incidentally take any pygmy-owls.

Reporting Requirements/Disposition of Dead or Injured Listed Animals

Upon finding a dead or injured threatened or endangered animal, initial notification must be made to the FWS's Division of Law Enforcement, 2450 West Broadway, Mesa, Arizona (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 handling 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 FWS 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, the FWS should be contacted regarding the final disposition of the animal.

CONSERVATION RECOMMENDATIONS

Sections 2(c) and 7(a)(1) of the ESA direct Federal agencies to utilize their authorities to further the purposes of the ESA 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 ACOE implement the following discretionary actions:

- Conduct or fund studies, using both protocol-level surveys and monitoring, and tracking of pygmy-owls via telemetry, to determine the species' habitat use patterns and relationships between owls and the human interface in northwest Tucson. Surveys involving simulated or recorded calls of pygmy-owls require an appropriate permit from the FWS. Contact AGFD in regard to State permitting requirements.
- Continue to actively participate in regional planning efforts, such as Pima County's Sonoran Desert Conservation Plan (SDCP), the Town of Marana's HCP, and other conservation efforts for the pygmy-owl.
- Assist in the implementation of recovery tasks identified in the Pygmy-owl Recovery Plan when approved by the FWS.
- Monitor the effectiveness of conservation measures associated with issuance of authorized permits.

REINITIATION-CLOSING STATEMENT

This concludes formal consultation with the ACOE on the proposed Silverbell Road realignment, Ina Road improvements, bridge replacement and widening, Ina Road improvements, Cortaro District Park, and Santa Cruz River bank protection project in the Town of Marana, 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 have assigned log number 02-21-02-F-0333 to this consultation. Please refer to that number in future correspondence regarding this consultation. Any questions or comments should be directed to Jason Douglas (520) 670-6150, (x226) or Sherry Barrett (520) 670-6150, (x223), of my Tucson staff.

Sincerely,

/s/ Steven L. Spangle
Field Supervisor

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

Regional Supervisor, Arizona Game and Fish Department, Tucson, AZ
Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
(Attn: Bob Broscheid)

Town of Marana Development Services, Marana, AZ (Attn: Jennifer Christelman)
WestLand Resources, Inc., Tucson, AZ (Attn: Jim Tress and Kimberly Otero)

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