

SUMMARY
BIOLOGICAL OPINION ON THE EFFECTS OF THE THORNYDALE ROAD
IMPROVEMENT PROJECT IN PIMA COUNTY, ARIZONA

Date of Opinion: February 25, 2002

Action Agency: Environmental Protection Agency (EPA), San Francisco, California

Project: The proposed action involves issuance of a National Pollutant Discharge Elimination System (NPDES) general permit under section 402 of the Clean Water Act from the EPA and a section 404 permit under the CWA from the Army Corps of Engineers (COE). The EPA is the lead Federal agency for this consultation. These permits will allow the widening and placement of flood control structures along Thornydale, Magee, and Cortaro Farms roads in Pima County.

Listed Species Affected: The endangered cactus ferruginous pygmy-owl (CFPO) (*Glaucidium brasilianum cactorum*) without critical habitat.

Biological Opinion: The proposed action is not likely to jeopardize the continued existence of the CFPO. There currently is no critical habitat for the CFPO, therefore none will be affected.

Incidental Take Statement:

Level of take anticipated: We do not anticipate the proposed action will incidentally cause any take in the form of harm, death, or injury of any CFPO. The project site is within a portion of a resident male CFPO's home range (600 meters [0.37 mile]). If this owl breeds, they and their young could be affected by construction noise, dust, traffic, or other human activity in connection with the construction of these capitol improvements. This project includes conservation measures such that the Service does not anticipate that these activities will constitute incidental take. Generally, we believe that the conservation measures adopted by the County as a result of this consultation, will reduce any CFPO effects below take. However, it is possible that non-lethal incidental take (in the form of harassment only) of this CFPO will occur within a 600-meter (0.37-mile) radius of its activity center as the result of ongoing construction activity.

Reasonable and Prudent Measures: The biological opinion presents four measures for reducing incidental take. Implementation of these measures through terms and conditions are mandatory. They are: (1) minimize vegetation disturbance, loss of key habitat components, and other potential adverse effects to CFPOs within the estimated home range of the resident single or CFPO pair; (2) minimize noise disturbance immediately adjacent to a CFPO nest or activity center; (3) promote connectivity to allow for movement within CFPO home ranges, between CFPO sites and adjacent suitable habitat within the project site and Conservation Lands; and (4) monitor construction activities

during and after completion of the project to ensure compliance with the terms and conditions and to determine their effectiveness to accomplish their stated goals. Report the findings of this monitoring to the Service and corrective measures that will be taken if measures are not met and desired goals are not achieved.

Terms and Conditions: Nineteen mandatory terms and conditions are included to implement the reasonable and prudent measures. They include a variety of measures to reduce incidental take of CFPOs, maintain sufficient habitat within the project vicinity to support owls, and provide movement corridors.

Conservation Recommendations: In furtherance of the purposes of the Endangered Species Act, we recommend implementing the following discretionary actions: (1) EPA and COE should conduct or fund studies using both monitoring and telemetry, to determine CFPO habitat use patterns and relationships between owls and the human interface in northwest Tucson; (2) EPA and COE should continue to actively participate in regional planning efforts, such as Pima County's SDCP, and other conservation efforts for the CFPO; and (3) EPA and COE should assist in the implementation of recovery tasks identified in the CFPO Recovery Plan when approved by the Service.

United States Department of the Interior
U.S. Fish and Wildlife Service
2321 West Royal Palm Road, Suite 103
Phoenix, Arizona 85021-4951
Telephone: (602) 242-0210 FAX: (602) 242-2513

In Reply Refer To:
AESO/SE
2-21-00-F-213

February 25, 2002

Mr. Terry Oda, Chief
Clean Water Act Standards and Permits Water Division
Environmental Protection Agency
75 Hawthorne Street
San Francisco, California 94105-3901

Subject: Final Biological Opinion on the Effects of the Thornydale Road Improvement Project
in Pima County, Arizona

Dear Mr. Oda:

This responds to the Environmental Protection Agency (EPA) May 29, 2001, request for formal consultation with the U.S. Fish and Wildlife Service (Service) pursuant to section 7 of the Endangered Species Act (ESA) (87 Stat. 884, as amended; 16 U.S.C. 1531 et seq.) on the effects of the proposed Thornydale Road Improvement Project on the endangered cactus ferruginous pygmy-owl (CFPO or owl) (*Glaucidium brasilianum cactorum*) without critical habitat and the endangered lesser long-nosed bat (*Leptonycteris curasoae yerbabuena*) without critical habitat.

The proposed action involves issuance of a National Pollutant Discharge Elimination System (NPDES) general permit under section 402 of the Clean Water Act (CWA) from the EPA and a section 404 permit under the CWA from the Army Corps of Engineers (COE). The EPA is the lead federal agency for this consultation. COE has suspended their issuance of a section 404 permit pending the completion of this consultation. These permits will allow the widening and placement of flood control structures along Thornydale, Magee, and Cortaro Farms roads in Pima County.

The EPA has requested Service concurrence that the proposed action is not likely to adversely affect the lesser long-nosed bat. We concur with this determination for the lesser long-nosed bat.

Consultation History

The Service and Pima County (County) began informal consultation on the proposed project on September 28, 1998, continuing with a series of meetings and telephone discussions. During this time, we worked closely with County staff to minimize effects of this proposed capital improvement. In January and September 2000, the County provided information regarding the

size, scope, and location of the proposed project. At that time, we understood the disturbance would occur primarily in previously cleared areas along the eastern portion of the right-of-way along Thornydale. Based on this information, on October 5, 2000, we concurred with the Corp's determination¹ that this project may affect, but is not likely to adversely affect the CFPO. Our concurrence was based on the following information: (1) construction activity would not take place within 100 meters of a CFPO nest or activity center; (2) no significant construction noise disturbance within 400 meters of a CFPO site during the breeding season would occur; (3) no vegetation in excess of 20% within 600 meters of an owl site would take place; (4) traffic delays during daily peak activity periods would not occur; and (5) the project would result in the removal of only 32 trees, which would be replaced with 332 trees (at a 10:1 replacement ratio) in addition to other planting of shrubs and other vegetation, resulting in substantially more vegetation upon completion onsite.

Between November 9-11, 2000, County contractors, graded a significant swath (approximately 25 to 75 feet) of vegetation along Thornydale Road, Magee Road, and Cortaro Farms Road right-of-ways, removing approximately 6.31 acres of upland vegetation containing approximately 198 trees instead of 32 expected by the Service. In addition, 309 saguaros were also removed, some of which were salvaged. We met with County staff on November 11, 2000, and they agreed to halt all grading and construction activity north of Magee Road until they reassessed the effects of their project. The County, acting as the non-federal representative for the EPA², determined the project would adversely affect the CFPO and submitted a draft BA (SWCA 2000) to the Service on November 27, 2000. On January 19, 2001, we notified the COE³ that we concurred with their determination that this project would have no effect on the CFPO south of Magee Road to Ina Road and COE agreed to suspend the 404 permit north of Magee Road. Since that time, we have had several meetings and discussions with County staff and consultants to redesign the project, minimizing adverse effects to the CFPO. On May 22, 2001, the EPA submitted a revised BA (SWCA 2001) for the portion of the project north of Magee Road and requested initiation of formal section 7 consultation with the Service. On June 27, 2001, we notified the EPA that sufficient information was provided, and formal consultation was initiated on the date we received the request (May 29, 2001). On October 2, 2001, November 9, 2001 and February 21, 2002 we requested, and you granted additional 30-day extensions to resolve issues related to adverse effects from this project. On November 29, 2001, we were asked to provide a draft biological opinion for review by December 10, 2001. The Service received comments from the EPA and the County on January 7, 2002.

This biological opinion is based on information provided in the revised BA (SWCA 2001), received on May 29, 2001, which is incorporated herein by reference; correspondence between

¹ The COE was, at that time, the lead federal agency for the entire project since the County was seeking a section 404 permit under the CWA for the entire project.

² The EPA is the lead federal agency for this consultation.

³ The COE remained lead federal agency for the portion of the project south of Magee Road.

the Service and the County; numerous telephone and personal conversations; field investigations; correspondence from, and meetings with the County, EPA, and AGFD; and other sources of information. References cited in this opinion are not a complete bibliography of all literature available on the species of concern, residential and commercial development and its effects, or on other subjects considered in this opinion. A complete administrative record of this consultation is on file at this office. We have assigned log number 2-21-00-F-213 to this consultation. Please refer to that number in future correspondence on this consultation.

BIOLOGICAL OPINION

I. DESCRIPTION OF THE PROPOSED ACTION

Proposed action

The proposed action is the issuance and the County's utilization of two CWA permits - a section 402 NPDES general permit from the EPA and a section 404 permit from the COE. Issuance of these permits will facilitate the construction of flood control structures and road improvements. The proposed project includes an approximately 1.6-mile reach of roadway, from Magee Road to approximately 800 feet north of Cortaro Farms Road, in northwestern Tucson, Pima County, Arizona (Figures 1, 2a, and 2b of BA). The project is located in Township 12S., Range 13E., sections 29 and 30. The elevation ranges from 2,326 to 2,360 feet. The project site is within one-quarter mile of a known CFPO, which is located west of Thornydale Road and south of Cortaro Farms Road. Prior to September 21, 2001, portions of the project were located in Critical Habitat Unit 4 for the CFPO (U.S. Fish and Wildlife Service 1999 [64 FR 37419]); however, on that date, the U.S. District Court of Arizona vacated this designation, remanding it back to the Service for further consideration. Therefore, there currently is no critical habitat for the CFPO.

The BA contains a detailed description of the proposed project. Generally, 3,440 feet of the existing two-lane Thornydale Road will be expanded to: (1) a four-lane, curbed roadway with multi-use lanes; (2) planted medians; (3) a pedestrian walkway; (4) utility adjustments and relocations; and (5) a roadway drainage system and cross drainage structures. The following are specific components of the project:

Multi-use Lanes

The proposed typical Thornydale Road section will increase the existing pavement width from its current 26-to-46-foot range to a width of 96 feet. This will allow for two travel lanes and turn bays, and a multi-use lane in each direction. The roadway will be designed to meet local and national standards for a design speed of 45 miles per hour (mph) from Magee Road to the northern terminus. The posted speed will be 40 mph from Magee Road to the northern terminus.

Median

A median will extend the length of the project area. The median will be 28 feet wide between Magee and Cortaro Farms Road and 24 feet with north of Cortaro Farms Road. The 28-foot median, which will be located in the area of two drainage structures (washes A and Bin Figures

2a in the BA) and raised approximately 30 inches through the use of concrete barriers, will extend north approximately 1,000 feet beginning about 400 feet north of Magee Road. The 24-foot median will extend north about 320 feet beginning about 400 feet north of Cortaro Farms Road. This median, which will not be raised, will be located in the vicinity of Wash C (Figure 2b in BA). Both medians will be planted with shrubs and trees (see 3.4 Habitat Restoration in BA).

Utilities

Overhead electric lines will be relocated underground with phone and lines on the west side of Thornydale Road. In addition, Tucson Water has a major water line that runs down the west leg of Cortaro Farms Road and turns north up Thornydale Road.

Drainage System

Existing drainage patterns in the project area will be modified to redirect contributing flow to appropriate storm drain and channel structures. This will include installation of two culverts, one at each of the southern two project area washes, and two roadside berms (see Figures 4, 5, 7, and 8 of BA). Drainage culverts will accommodate 4 lanes of roadway and median.

Magee and Cortaro Farms Roads

These road will both be widened east and west of Thornydale Road as part of this project.

Magee Road

This road will be widened east and west of Thornydale Road as part of this project, extending 750 feet west and 460 feet east of the Thornydale Road. Improvements will include aligning the existing travel lanes across Thornydale Road and constructing a through lane in each direction and an exclusive left-turn lane. The left turn lane will be added to the west leg of Magee Road. This will be done by adding additional pavement to the north side of the existing roadway. The roadway will be three lanes wide at the Thornydale Road intersection and will taper down to two lanes about 800 feet from the intersection. A drainage ditch will be constructed along the north side of the road west of Thornydale. East of Thornydale, improvements will involve reconstructing the road for approximately 200 feet.

Cortaro Farms Road

Road improvements will extend 1,050 feet west and 850 feet east of the Thornydale Road. Improvements will include widening of both the east and west legs to accommodate five lanes of traffic with a small median at the Thornydale Road intersection. Widening will begin about 950 feet west of Thornydale Road. Along the east side of Thornydale Road, approximately 300 feet of roadway will be reconstructed and an additional 300 feet will be required to taper the pavement back to the existing roadway section.

The County has incorporated a number of conservation measures to avoid and minimize impacts (see 3.0 Measures to Avoid and Minimize, and Mitigate Impacts in BA). They are summarized below:

- Redesign drainage crossings on Thomydale Road and Cortaro Farms Road to minimize the area needed for clearing and allow the County to plant more trees that are closer to the roadway, thereby reducing CFPO flight distance.
- Replace the drainage channel along the east side of Thornydale Road and on the north side of Magee Road with small berms that can be revegetated with much less construction-related impact.
- Remove the median opening located approximately 900 feet north of Magee Road to increase the median area available for tree planting.
- Widen the median widths thereby increasing the area available for tree planting in the median to allow trees to be planted closer to the roadway.
- Plant 825 15-gallon trees (i.e., blue palo verde, ironwood, mesquite, sweet acacia, desert hackberry), 477 5-gallon woody shrubs, 5,781 1-gallon non-woody shrubs, and 4.4 acres of ground cover within the project site. The County will also plant trees and shrubs within some portions of the easement that currently are sparsely vegetated. Drip irrigation will be used to establish and maintain these plants, and the site will be monitored to ensure survival.
- Reduce the left turn bay lane length to 150 feet at Magee Road for southbound traffic and at Placita Oeste for northbound traffic. This will increase the median area available for tree planting.
- Install a guardrail at the face of the outside curb along Thornydale Road. This will allow for tree planting closer to the edge of the roadway to reduce opening widths.
- Reduce the maximum highway speed from the current 45 mph to 40 mph.
- At strategic locations, place clumps of large boxed trees on either side of Cortaro Farms Road and Thornydale Road to reduce the opening owls would have to fly across, thereby improving connectivity of the existing CFPO territory to adjacent habitats.
- Restrict vegetation disturbance within 100 meters of a CFPO nest or activity center.
- Restrict noise disturbance from heavy equipment (e.g., grading, paving, cutting, filling, hauling, heavy earthwork, clearing, grubbing, or work in culverts/storm drains) within 400 meters of a CFPO activity site during the CFPO breeding season (February 1 to July 31).

- There will be no vegetation disturbance greater than 20 percent within 600 meters of a CFPO site (within its estimated home range). (This percentage was exceeded during initial vegetation clearing activities. Consequently, the County proposed during informal consultation with the Service that off-site land acquisition will be undertaken to return to 20 percent the total acreage of project-related disturbance). The County is actively pursuing possession⁴ for the conservation of the CFPO approximately 35.6 acres shown in Appendix A. These lands have yet to be obtained by the County; however, they have entered into a Memorandum of Agreement (MOA) with the Service specifying that these parcels, or others acceptable by the Service, will be placed in conservation status and managed for the benefit of the CFPO in perpetuity (Appendix A).
- The County has developed management prescriptions for the Conservation Lands with the intent to protect existing CFPO habitat and to provide movement corridors. Special efforts may be targeted where needed to maintain, protect, and restore natural habitat values and ecosystem integrity (Appendix B).
- The County will not undertake any activity during the breeding season which results in traffic congestion or delays one hour before, during, and one hour after sunrise and sunset to reduce noise.
- Grading will only occur between Magee Road and the culvert extension north of Cortaro Farms Road prior to February 1. Light construction activity (e.g. installation of water lines, utilities, traffic lights, and surveying) may occur during this time frame. After July 31, heavy equipment may continue with operation in this zone. For the purposes of this project, installation of water lines and utilities are not considered light construction and will not be conducted during the CFPO breeding season.
- The County will modify project construction activities and timing as necessary within one-quarter mile of a CFPO site or nest with approval of the Service and coordination with AGFD, dependent on the status of owls in the vicinity.

II. STATUS OF THE SPECIES

A detailed description of the life history and ecology of the CFPO may 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 other information available at the Arizona Ecological Services Field Office. Information specific to the CFPO in Arizona is limited. Research in Texas has provided useful insights into the ecology of the subspecies, and in some instances represents the best available information; however, habitat and environmental conditions are somewhat different in Arizona and conclusions based on Texas information are tentative.

⁴ Through purchase or condemnation.

Species description

The Service listed the Arizona population of the CFPO as a distinct population segment (DPS) on March 10, 1997, (U.S. Fish and Wildlife Service 1997 [62 FR 10730]). The past and present destruction, modification, or curtailment of habitat is the primary reason for the decrease in population levels of the CFPO. On July 12, 1999, we designated approximately 731,712 acres of critical habitat supporting riverine, riparian, and upland vegetation in seven critical habitat units, located in Pima, Cochise, Pinal, and Maricopa counties in Arizona (U.S. Fish and Wildlife Service 1999 [64 FR 37419]). However, on September 21, 2001, the U.S. District Court for the District of Arizona vacated this final rule designating critical habitat for the CFPO, and remanded its designation back to the Service for further consideration.

Life history

CFPOs are small birds, averaging 6.75 inches in length. CFPOs are reddish-brown overall, with a cream-colored belly streaked with reddish-brown. The CFPO is crepuscular/diurnal, with a peak activity period for foraging and other activities at dawn and dusk. During the breeding season, they can often be heard calling throughout the day, but most activity is reported between one hour before sunrise to two hours after sunrise, and late afternoon/early evening from two hours before sunset to one hour after sunset (Collins and Corman 1995).

A variety of vegetation communities are used by CFPOs, such as: riparian woodlands, mesquite (*Prosopis* spp.) “bosques” (Spanish for woodlands), Sonoran Desertscrub, and semidesert grassland communities, as well as nonnative vegetation within these communities. While plant species composition differs among these communities, there are certain unifying characteristics such as the presence of vegetation in a fairly dense thicket or woodland, the presence of trees or saguaros large enough to support cavity nesting, and elevations below 4,000 ft. Historically, CFPOs were associated with riparian woodlands in central and southern Arizona. Plants present in these riparian communities include cottonwood, willow (*Salix* spp.) and hackberry (*Celtis* spp.). Cottonwood trees are suitable for cavity nesting, while the density of mid- and lower-story vegetation provides necessary protection from predators and an abundance of prey items for the CFPO. Mesquite bosque communities are dominated by mesquite trees, and are described as mesquite forests due to the density and size of the trees.

Over the past several decades, CFPOs have been primarily found in the Arizona Upland Subdivision of the Sonoran Desert, particularly Sonoran Desertscrub (Brown 1994). This community in southern Arizona consists of paloverde, ironwood, mesquite, acacia, bursage (*Ambrosia* spp.), and columnar cacti (Phillips et al. 1964, Monson and Phillips 1981, Davis and Russell 1984, Johnson and Haight 1985, Johnsgard 1988). However, over the past several years, CFPOs have also been found in riparian and xeroriparian habitats 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 (*Prosopis velutina*) in uplands and linear woodlands of various tree species along bottoms and washes.

The density of trees and the amount of canopy cover preferred by CFPOs in Arizona is unclear. However, preliminary results from a habitat selection study indicate that nest sites tend to have a higher degree of canopy cover than random sites (Wilcox et al. 2000). For areas outside Arizona, CFPOs are most commonly characterized by semi-open or open woodlands, often in proximity to forests or patches of forests. Where they are found in forested areas, they are typically observed along edges or in openings, rather than deep in the forest itself (Binford 1989, Sick 1993), although this may be a bias of increased visibility. Overall, vegetation density may not be as important as patches of dense vegetation with a developed canopy layer interspersed with open areas. The physical settings and vegetation composition varies across *G. brasilianum*'s range and, while vegetation structure may be more important than composition (Wilcox et al. 1999, Cartron et al. 2000a), higher vegetation diversity is found more often at nest sites than at random sites (Wilcox et al. 2000).

CFPOs typically hunt from perches in trees with dense foliage using a perch-and-wait strategy; therefore, sufficient cover must be present within their home range for them to successfully hunt and survive. Their diverse diet includes birds, lizards, insects, and small mammals (Bendire 1888, Sutton 1951, Sprunt 1955, Earhart and Johnson 1970, Oberholser 1974) and frogs (Proudfoot et al. 1994). The density of annuals and grasses, as well as shrubs, may be important to the CFPO's prey base. Shrubs and large trees also provide protection against aerial predation for juvenile and adult CFPOs and cover from which they may capture prey (Wilcox et al. 2000).

CFPOs are considered non-migratory throughout their range by most authors, and have been reported during the winter months in several locations, including Organ Pipe Cactus National Monument (OPCNM) (R. Johnson unpubl. data, T. Tibbitts, Organ Pipe Cactus National Monument unpubl. data). CFPOs begin nesting activities in late winter to early spring. In Arizona differences between nest sites may vary by as much as two months (Abbate et al. 1996, S. Richardson, Arizona Game and Fish Department unpubl. data). As with other avian species, this may be the result of a second brood or a second nesting attempt following an initial failure (Abbate et al. 1996). In Texas, juveniles remained within approximately 165 feet of adults until dispersal. Dispersal distances (straight line) of 20 juveniles monitored from their natal sites to nest sites the following year averaged 5 miles (ranged from 0.75 to 19 miles (G. Proudfoot unpubl. data). Telemetry studies of dispersing juveniles in Arizona during 1999 and 2000 ranged from 1.4 to 12.9 miles (straight line distance) (n=6, mean 6.2 miles) in 1999, and 1.6 to 11.7 miles (n=6, mean 5.8 miles) in 2000 (S. Richardson and M. Ingraldi, Arizona Game and Fish Department unpubl. data). CFPO telemetry studies have documented movement of owls between southern Pinal County and northwestern Tucson (S. Richardson and M. Ingraldi, Arizona Game and Fish Department unpubl. data). Typically, juveniles dispersed from natal areas in July, but did not appear to defend a territory until September. They may move up to one mile in a night; however, they typically fly short distances from tree to tree instead of long single flights (S. Richardson, Arizona Game and Fish Department unpubl. data). Subsequent surveys during the spring have found that locations of male CFPOs are in the same general location as last observed the preceding fall.

Apparently, unpaired females may also remain in the same territory for some period of time. In the spring of 2001, an unpaired female (the male died in 2000) remained in the same territory as was occupied in previous years well into the spring, exhibiting territorial behavior (calling) for approximately two months until ultimately switching territories and pairing with an unpaired male and successfully nesting (S. Richardson, Arizona Game and Fish Department unpubl. data). Researchers suspect that if this unpaired female could have attracted an unpaired male during that time, she would have likely remained in her original territory. Apparently at some point the urge to pair is too strong to remain and they seek out new mates.

In Texas, Proudfoot (1996) noted that, while CFPOs used between 3 and 57 acres during the incubation period, they defend areas up to 279 acres in the winter. Therefore, a 280-acre home range is considered necessary for CFPOs. Proudfoot and Johnson (2000) indicate males defend areas with radii from 1,100 - 2,000 feet. Initial results from ongoing studies in Texas indicate that the home range of CFPOs may also expand substantially during dry years (G. Proudfoot unpubl. data).

Species status and distribution range wide

The CFPO is one of four subspecies of ferruginous pygmy-owl. CFPOs are known to occur 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. It is unclear at this time if the ranges of the eastern and western populations of the ferruginous pygmy-owl merge in southern Mexico. Recent genetic studies suggest that ferruginous pygmy-owl populations in southern Arizona and southern Texas are distinct subspecies, and that there is no genetic isolation between populations in the United States and those immediately south of the border in northwestern or northeastern Mexico (Proudfoot and Slack 2001). Results also indicate a comparatively low haplotypic diversity in the northwestern Tucson population, suggesting that it may be recently separated from those in the Altar Valley, Arizona, and in Sonora and Sinaloa, Mexico.

The Service is currently funding habitat studies and surveys in Sonora, Mexico to determine the distribution and relative abundance of the CFPO there. Based on the lack of sightings, they may be absent, rare, or uncommon in northern Sonora, Mexico (Hunter 1988, U.S. Fish and Wildlife Service 1997). Preliminary results indicate that CFPOs are present in northern and central Sonora (U.S. Fish and Wildlife Service unpubl. data). Further studies are needed to determine their distribution in Mexico.

The range of the Arizona DPS of the CFPO extends from the International Border with Mexico north to central Arizona. The northernmost historic record for the CFPO is from New River, Arizona, about 35 miles north of Phoenix, where Fisher (1893) reported the CFPO to be "quite common" in thickets of intermixed mesquite and saguaro cactus. According to early surveys referenced in the literature, the CFPO, 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, CFPOs were detected at Dudleyville on the San Pedro River as recently as 1985 and 1986 (Arizona Game and Fish Department unpubl. data, Hunter 1988).

Records from the eastern portion of the CFPO's range include a 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. CFPOs 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 CFPOs in Arizona for the period of 1971 to 1988. Formal surveys for the CFPO on OPCNM began in 1990, with one located that year. Beginning in 1992, survey efforts conducted in cooperation with the AGFD, located three single CFPOs on OPCNM (U.S. Fish and Wildlife Service unpubl. data and Organ Pipe Cactus National Monument unpubl. data). In 1993, surveys were conducted at locations where CFPOs had been sighted since 1970. Only one CFPO was detected during these survey periods, and it was located in northwestern Tucson (Felley and Corman 1993). In 1994, a pair and single owl of unknown breeding status were located in northwestern Tucson during informal survey work by AGFD (Abbate et al. 1996). In 1995, AGFD confirmed 5 adult CFPO and one juvenile, one of which was the first nest in many years. In 1996, AGFD focused their survey efforts in the Tucson Basin. A total of 12 CFPOs were detected, including one known nesting pair and their 2 fledglings which successfully fledged. Three additional CFPOs and three other unconfirmed reports were also recorded at OPCNM in 1996.

While the majority of Arizona CFPO detections in the last seven years have been from the northwestern Tucson area in Pima County, CFPOs have also been detected in southern Pinal County, at OPCNM, Cabeza Prieta National Wildlife Refuge (CPNWR), Buenos Aires National Wildlife Refuge (BANWR), and on the Coronado National Forest. The following is a brief summary of recent owl numbers and distribution⁵:

In 1997, survey efforts of AGFD located a total of five CFPOs in the Tucson Basin study area (the area bounded to the north by the Picacho Mountains, the east by the Santa Catalina and Rincon mountains, the south by the Santa Rita and Sierrita Mountains, and the Tucson Mountains to the west). Of these owls, one pair successfully fledged (young that left their nest cavity) two young which were banded. Two adult males were also located at OPCNM, with one reported from a previously unoccupied area (T. Tibbitts, Organ Pipe Cactus National Monument pers. comm. 1997).

In 1998, survey efforts in Arizona increased substantially and, as a result, more CFPOs were documented, which may at least in part account for a larger number of known owls. In 1998, a total of 35 CFPOs were confirmed (S. Richardson, Arizona Game and Fish Department unpubl. data, U.S. Fish and Wildlife Service unpubl. data, T. Tibbitts, Organ Pipe Cactus National Monument unpubl. data, D. Bieber, Coronado National Forest unpubl. data).

⁵ To a large degree, survey effort plays an important factor in where owls have been documented. Survey effort has not been consistent over the past several years in all areas of the state, affecting the known distribution and numbers of owls in any particular area.

In 1999, a total of 41 adult CFPOs were found in Arizona at 28 sites. Of these sites, 11 had nesting confirmed by AGFD and the Service. CFPOs were found in three distinct regions of the state: Tucson Basin, Altar Valley, and OPCNM. Almost half of the known owl sites were in the Altar Valley. Overall, mortality was documented for a number of fledglings due to natural (e.g., predation) or unknown causes. Of the 33 young found, only 16 were documented as surviving until dispersal (juveniles known to have successfully dispersed from their natal area). It is unclear what the survival rate for CFPOs is; however, as with other owls and raptors, a high mortality (50% or more) of young is typical during the first year of life.

Surveys conducted in 2000 resulted in 24 confirmed CFPO sites (i.e. nests and resident CFPO sites) and several other unconfirmed sites (S. Richardson, Arizona Game and Fish Department unpubl. data, T. Tibbitts, Organ Pipe Cactus National Monument unpubl. data, U.S. Fish and Wildlife Service unpubl. data). A total of 34 adult CFPOs were confirmed. Nesting was documented at 7 sites and 23 fledglings were confirmed. A total of 9 juveniles were known to have successfully dispersed from their natal areas in 2000. Successful dispersal was not confirmed at two nests with four fledglings. The status of the remaining fledglings was unknown; however, they were presumed dead.

Surveys conducted during the 2001 season resulted in a total of 47 adult CFPOs confirmed at 29 sites⁶ in Arizona (S. Richardson, Arizona Game and Fish Department unpubl. data, T. Tibbitts, Organ Pipe Cactus National Monument unpubl. data, U.S. Fish and Wildlife Service unpubl. data). There were also several other unconfirmed sites that are not included in these totals. Nesting was documented at 17 sites and 24 young were confirmed to have successfully fledged. In addition, there were 2 nests with young that potentially could have fledged young; however, this was not confirmed. Similar to the previous three years, there was over a 50% fledgling mortality documented in 2001 (S. Richardson, Arizona Game and Fish Department unpubl. data). The following regions of the state are currently known to have CFPOs:

- **Tucson Basin** (northwestern Tucson and southern Pinal County) - A total of 8 adults (3 pairs and 2 single resident males) were confirmed at 5 sites, all of which were in Pima County. One single unpaired male CFPO was documented in southern Pinal County. Three nests in northwestern Tucson were confirmed, all with young.
- **Altar Valley** - A total of 18 adult CFPOs were documented at 12 sites⁷. As a result of increased access to portions of the valley, the number of known owls increased to 7 pairs and 4 resident single owls. A total of 7 nests were confirmed.

⁶ CFPO sites are nests and resident male CFPO sites that have been confirmed by AGFD or the Service.

⁷ There was one additional female in Altar Valley found dead in a saguaro cavity, suspected to have been killed by a screech owl (S. Richardson, Arizona Game and Fish Department unpubl. data).

- **OPCNM and CPNWR** - Twelve adults, consisting of 2 pairs and 4 single CFPOs were confirmed at 8 sites. Three nests were active. Two new sites were documented on the CPNWR and 1 north of OPCNM near Ajo, Arizona.
- **Other Areas** - A total of 9 adults, consisting of 4 pairs and 1 single CFPO at 5 sites documented elsewhere in southern Arizona. Nesting was confirmed at 4 of these sites. It is unknown how many of these young successfully dispersed. There were several other possible CFPO detections reported elsewhere in the state, but they were not confirmed.

One factor affecting the known distribution of CFPOs in Arizona is where early naturalists spent most of their time and where recent surveys have taken place. For example, a majority of surveys in the recent past (since 1993) have taken place in OPCNM and in the Tucson Basin, and these areas are where most owl locations have been recorded. However, over the past three years, large, previously unsurveyed areas have been inventoried for owls, resulting in a much wider distribution than previously thought. As a result, our knowledge is changing as to CFPO distribution and habitat needs as new information is collected. For example, before 1998, very few surveys had been completed in the Altar Valley in southern Pima County. Prior to 1999, the highest known concentration of CFPOs in the state was in northwestern Tucson. However, in 1999, after extensive surveys in Altar Valley, more owls were found there (18 adults) than in northwestern Tucson (11 adults), although until 2001, there have been fewer nest sites in Altar Valley than in the Tucson Basin (S. Richardson, Arizona Game and Fish Department unpubl. data). As a result, our knowledge is changing as to their distribution and habitat needs as new information is collected.

Range wide trend

One of most urgent threats to CFPOs in Arizona is thought to be the loss and fragmentation of habitat (U.S. Fish and Wildlife Service 1997, Abbate et al. 1999). The complete removal of vegetation and natural features required for many large-scale and high-density developments directly and indirectly impacts CFPO survival and recovery (Abbate et al. 1999).

Habitat loss, degradation, and fragmentation are widely accepted causes contributing to raptor population declines worldwide (Snyder and Snyder 1975, Newton 1979, LeFranc and Millsap 1984). Habitat fragmentation is the process by which a large and continuous block of natural habitat is transformed into much smaller and isolated patches by human activity (Noss and Csuti 1994). Fragmentation has two components (1) reduction of the total amount of habitat type and (2) apportionment of remaining habitat into smaller, more isolated patches (Harris 1984, Wilcove et al. 1986, Saunders et al. 1991). Casualties caused by 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 CFPO sites to residential areas in northwestern Tucson, these interactions may be a significant cause of owl mortality there (Cartron et al. 2000a).

Nesting in small natural patches may have additional risks. For example, Haug (1985) found burrowing owl home range size increases with the percentage of vegetation disturbance. In fragmented landscapes, burrowing owls may forage greater distances and spend more time away from the nest, making them more vulnerable to predators, and therefore, less efficient at reproduction (Warnock and James 1997). As fragmentation increases, competition for fewer productive CFPO territories may occur (Abbate et al. 1999). Unlike other larger birds that can fly long distances over unsuitable or dangerous areas to establish new territories, CFPOs, because of their small size, and their short style of flight are exposed to greater risks from predation and other threats (Abbate et al. 1999).

Site tenacity in birds is one of many factors that may create time lags in response to fragmentation and other disturbances. Individuals may remain in sites where they bred successfully in the past, long after the habitat has been altered (Wiens 1985). Because of lack of data, it is unclear whether site tenacity for CFPOs, in increasingly fragmented landscapes, such as exists in the action area, is a factor. For example, researchers have been closely monitoring an established CFPO site (documented each year since 1996) in which the male died in 1999, apparently from a collision with a fence (S. Richardson, Arizona Game and Fish Department unpubl. data.). This site has not been known to be active since 1999. It has the highest amount of development (33%) within its estimated home range of any other known nest site (S. Richardson, Arizona Game and Fish Department unpubl. data.). The site will continued to be monitored to determine if new owls reestablish a nest site.

In northwestern Tucson, all currently known CFPO locations, particularly nest sites, are in low-density housing areas where abundant native vegetation separates structures. Additionally, they are adjacent to or near large tracts of undeveloped land. CFPOs appear to use non-native vegetation to a certain extent, and have been observed perching in non-native trees in close proximity to individual residences. However, the persistence of CFPOs in areas with an abundance of native vegetation indicates that a complete modification of natural conditions likely results in unsuitable habitat conditions for CFPOs. While development activities are occurring in close proximity to owl sites, particularly nest sites, overall noise levels are low. Housing density is low, and as a result, human presence is also generally low. Roads in the areas are typically dirt or two-lane paved roads with low speed limits that minimizes traffic noise. Low density housing areas generally have lower levels of traffic noise because of the limited number of vehicles traveling through the area.

Other factors contributing to the decline of CFPO habitat include the destruction of riparian bottomland forests and bosques. It is estimated that 85 to 90% of low-elevation riparian habitats in the southwestern U.S. have been modified or lost; these alterations and losses are attributed to woodcutting, non-native plant invasions, urban and agricultural encroachment, water diversion and impoundment, channelization, groundwater pumping, livestock overgrazing, and hydrologic changes resulting from various land-use practices (e.g., Phillips et al. 1964, Carothers 1977, Kusler 1985, Jahrsdoerfer and Leslie 1988, U.S. Fish and Wildlife Service 1988, U.S. General Accounting Office 1988, Szaro 1989, Dahl 1990, State of Arizona 1990, Bahre 1991). Cutting of

trees for domestic and industrial fuel wood was so extensive throughout southern Arizona that, by the late 19th century, riparian forests within tens of miles of towns and mines had been decimated (Bahre 1991). Mesquite was a favored species because of its excellent fuel qualities. In the project area, the famous vast forests of "giant mesquites" along the Santa Cruz River in the Tucson area described by Swarth (1905) and Willard (1912) fell to this threat, as did the "heavy mesquite thickets" where Bendire (1888) collected CFPO specimens along Rillito Creek, a Santa Cruz River tributary, in present-day Tucson. Only remnant fragments of these bosques remain.

Regardless of past distribution in riparian areas, it is clear that the CFPO has declined throughout Arizona to the degree that it is now extremely limited in distribution in the state (Johnson et al. 1979, Monson and Phillips 1981, Davis and Russell 1984, Johnson-Duncan et al. 1988, Millsap and Johnson 1988, Monson 1998). A very low number of CFPOs in riparian areas in recent years may reflect the loss of habitat connectivity rather than the lack of suitability (Cartron et al. 2000b).

In recent decades, the CFPO's riparian habitat has continued to be modified and destroyed by agricultural development, woodcutting, urban expansion, and general watershed degradation (Phillips et al. 1964, Brown et al. 1977, State of Arizona 1990, Bahre 1991, Stromberg et al. 1992, Stromberg 1993a and 1993b). Sonoran Desertscrub has been affected to varying degrees by urban and agricultural development, woodcutting, and livestock grazing (Bahre 1991). Pumping of groundwater and the diversion and channelization of natural watercourses are also likely to have reduced CFPO habitat. Diversion and pumping result in diminished surface flows, and consequent reductions in riparian vegetation are likely (Brown et al. 1977, Stromberg et al. 1992, Stromberg 1993a and 1993b). Channelization often alters stream banks and fluvial dynamics necessary to maintain native riparian vegetation. The series of dams along most major southwestern rivers (e.g., Colorado, Gila, Salt, and Verde rivers) have altered riparian habitat downstream of dams through hydrological and vegetational changes, and have inundated former habitat upstream.

In the United States, CFPOs are rare and highly sought by bird watchers, 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 CFPO (Oberholser 1974, Tewes 1993). For example, in 1996, a resident in Tucson reported a CFPO 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 (S. Richardson, Arizona Game and Fish Department pers. comm. 1999).

One of the few areas in Texas known to support CFPOs continues to be widely publicized as having organized field trips and birding festivals (American Birding Association 1993, Tropical Birds of the Border 1999). Resident CFPOs are found at this highly visited area only early in the breeding season, while later in the season they could not be detected. O'Neil (1990) also indicated that five birds initially detected in southern Texas failed to respond after repeated visits by birding tours. It is unknown if the birds habituate to the playing of taped calls and stopped

responding, or if they abandoned the area. Oberholser (1974) and Hunter (1988) additionally indicated that in southern Texas, recreational birdwatching may disturb owls at highly visited areas.

Human activities near nests at critical periods of the nesting cycle may cause CFPOs to abandon their nest sites. In Texas, 3 of 102 CFPO nests monitored from 1994-1999 were abandoned during the early stage of egg laying. Although unknown factors may have contributed to this abandonment, researchers in Texas associated nest abandonment with nest monitoring (G. Proudfoot pers. comm.). Some outdoor recreational activities (e.g., off road vehicle [ORV] and motor bike use/racing, firearm target practicing, jeep tours, etc.) may disturb CFPOs during their breeding season (particularly from February through July (G. Proudfoot pers. comm. 1999 and S. Richardson, Arizona Game and Fish Department pers. comm. 1999). Noise disturbance during the breeding season may affect productivity; disturbance outside of this period may affect the energy balance and, therefore survival. Wildlife may respond to noise disturbances during the breeding season by abandoning their nests or young (Knight and Cole 1995). It has also become apparent that disturbance outside of a species' breeding season may have equally severe effects (Skagen et al. 1991).

Currently, all known nesting CFPOs within northwestern Tucson are located in areas containing no development or low-density housing developments that are adjacent to undeveloped tracts of land with varying amounts of noise disturbance. Individual CFPOs may react differently to noise disturbances, some individuals exhibiting less tolerance than others. Noise can affect animals by disturbing them to the point that detectable change in behavior may occur. Such behavioral changes can affect their activity and energy consumption (Bowles 1995). Dangerous or unfamiliar noises are more likely to arouse wildlife than harmless and familiar noises. Habituation is the crucial determinant of success in the presence of noisy disturbances. The habituation process can occur slowly, so it may not be detected in the short-term. In the long-term, some nesting birds become more tenacious and less responsive in the presence of human disturbance if they are not deliberately harassed (Burger and Gochfeld 1981). It is unknown if noise habituation occurs in some CFPOs as it does with other bird species. Robert and Ralph (1975), Schreiber et. al (1979), Cooke (1980), Parsons and Burger (1982), Ainley et al. (1983), and McNicholl (1983) found that adult birds, and chicks to some extent, habituated to the presence of humans, and their responses to people seemed to be less than those of undisturbed birds. Burger and Gochfeld (1981) and Knight et al. (1987) found responses to noise disturbances and habituation in nesting birds become more tenacious and less responsive in the presence of human disturbance if they were not deliberately harassed.

Because of the lack of data specific to this subspecies in Arizona, we must also rely in part on our knowledge of effects this type of action may have on CFPOs elsewhere and other species, particularly raptors. Raptors in frequent contact with human activities tend to be less sensitive to additional noise disturbances than raptors nesting in remote areas. However, exposure to direct human harassment may make raptors more sensitive to noise disturbances (Newton 1979). Where prey is abundant, raptors may even occupy areas of high human activity, such as cities and airports (Newton 1979, Ratcliffe 1980, White et al. 1988). The timing, frequency, and

predictability of the noise disturbance may also be factors. Raptors become less sensitive to human disturbance as their nesting cycle progresses (Newton 1979). Studies have suggested that human activities within breeding and nesting territories could affect raptors by changing home range movements (Anderson et al. 1990) and causing nest abandonment (Postovit and Postovit 1987, Porter et al. 1973).

Application of pesticides and herbicides in Arizona occurs year-round, and these chemicals pose a potential threat to the CFPO. The presence of CFPOs 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 CFPOs and may be a threat to CFPOs and their prey; in one case, drums of toxic solvents were found within one mile of a CFPO detection (Abbate et al. 1999).

Little is known about the rate or causes of mortality in CFPOs; however, they are susceptible to predation from a wide variety of species. In Texas, eggs and nestlings were depredated by racoons (*Procyon lotor*) and bullsnakes (*Pituophis melanoleucus*). Both adult and juvenile CFPO are likely killed by great horned owls (*Bubo virginianus*), Harris' hawks (*Parabuteo unicinctus*), Cooper's hawks, and eastern screech-owls (*Otus asio*) (Proudfoot and Johnson 2000, G. Proudfoot unpubl. data). CFPOs 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 few nests have been monitored (n = 21 from 1996-1999). Additional research is needed to determine the effects of predation, including nest depredation, on CFPOs in Arizona and elsewhere.

Another factor that may affect CFPOs is interspecific competition/predation. In Texas, depredation of two adult female CFPOs nesting close to screech-owls was recorded. These incidences were recorded as "depredation by screech-owl" after examination of the CFPO corpses and assessment of circumstances (i.e., one CFPO attempted to nest in a box that was previously used as screech-owl roost site, the other established a nest in a box within 5 meters (16 feet) of screech-owl nest site). In 2001, an unpaired female CFPO was found dead in a tree cavity, apparently killed by a screech-owl (S. Richardson, Arizona Game and Fish Department unpubl. data). Conversely, CFPOs and screech-owls have also been recorded successfully nesting within 2 meters (7 feet) of each other in the same tree without interspecific conflict (G. Proudfoot unpubl. data). The relationship between CFPO and other similar small owl species needs further study.

Direct and indirect human-caused mortalities (e.g., collisions with cars, glass windows, fences, power lines, domestic cats [*Felis domesticus*], etc.), while likely uncommon, are often underestimated, and probably increase as human interactions with owls increase (Banks 1979, Klem 1979, Churcher and Lawton 1987). This may be particularly important in the Tucson area where many CFPOs are located. CFPOs flying into windows and fences, resulting in serious injuries or death to the birds, have been documented twice. A CFPO collided into a closed

window of a parked vehicle; it eventually flew off, but had a dilated pupil in one eye indicating serious neurological injury as the result of this encounter (Abbate et al. 1999). In another incident, an adult owl was found dead on a fence wire; apparently it flew into a fence and died (S. Richardson, Arizona Game and Fish Department unpubl. data). AGFD also has documented an incident of individuals shooting BB guns at birds perched on a saguaro which contained an active CFPO nest. In Texas, two adult CFPOs and one fledging were killed by a domestic cat. These owls used a nest box about 75 meters (246 feet) from a human residence. In 2001, predation by a domestic cat is also suspected by researchers in at least one instance in northwestern Tucson (S. Richardson, Arizona Game and Fish Department unpubl. data). The female owl that had joined and paired with the resident male near the project site was found dead from apparent wounds sustained from a cat. Free roaming cats can also affect the number of lizards, birds, and other prey species available to CFPOs; however, very little research has been done in the Southwest on this potential problem.

CFPOs have been observed moving around the perimeter of golf courses, avoiding non-vegetated areas. Roads and other openings may act as barriers to their movements (Abbate et al. 1999, S. Richardson, Arizona Game and Fish Department unpubl. data). On one occasion, a radio-tagged dispersing juvenile stopped within 0.7 mile of Interstate 10 where there were large openings and few trees or shrubs, and reversed its direction (Abbate et al. 1999). However, radio-tagged, juvenile CFPOs have crossed two-lane roads with low to moderate vehicular traffic, where trees and large shrubs were present on either side (Abbate et al. 1999). Most recently, CFPOs monitored during the summer 2001 dispersal period were observed near two lane roads on several occasions (Arizona Game and Fish Department unpubl. data). Although owls were not directly observed crossing roads, radio telemetry data were collected on either side of roadways. Movement across roads appeared to occur during the night, although transmitted owls were not continuously monitored. Because of a lack of funds and personnel, AGFD researchers are at best only able to collect relocations during 2 random times during a 24-hour period, therefore, the time and location of this crossing is unknown.

CFPOs are capable of flying short distances up to 100 feet or more over undisturbed vegetation (e.g., Sonoran Desertscrub, semidesert grasslands, or riparian areas) with little or no human activities or structures such as roads, fences, buildings, etc. (G. Proudfoot, unpubl. data, S. Richardson, Arizona Game and Fish Department unpubl. data). 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 roads (greater than 40 feet), may act as barriers or significantly restrict 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 can cause owls to fly directly in the pathway of oncoming cars and trucks, significantly increasing the threat of owls being struck. Among others, the following measures can minimize these threats and allow successful movement across roadways: (1) decrease the canopy openings between trees on either side of roads; (2) increase the height of trees adjacent to roadways allowing owls to fly at higher levels above vehicles; (3) increase the density of trees along roadways that provide greater shelter and cover from predators and human activities; and (4) decrease vehicular speed limits. Specific research is needed to determine at what distance do road and clear zone widths significantly affect successful owl movement, types of vegetation needed, roadway and landscaping designs, speed limits, etc.

Telemetry data collected by AGFD in 2001 indicate that owl movement is affected by roads and traffic (S. Richardson, Arizona Game and Fish Department, unpubl. data). On two separate occasions within the action area, juvenile owls fitted with radio transmitters were tracked moving along washes and upland areas with native vegetation until they came upon busy roads with relatively wide clear zones on either side of the roadways. These owls stopped and were repeatedly observed reacting to passing vehicular traffic by retreating from the road edge vegetation to nearby trees as cars and trucks passed by. They appeared to be affected by road width, the density of vegetation on either side of the roadway, and traffic volume. In both cases, they eventually crossed these roads during lower traffic periods at areas with narrower gaps in vegetation where there were trees present on either side of the road. More research is needed to fully understand how these and other factors affect owl movement.

Researchers in Arizona have found that CFPOs require habitat linkages, within and between territories 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 shade and cool temperatures is necessary (S. Richardson, Arizona Game and Fish Department unpubl data, Abbate et al. 1999). CFPOs, 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 essential 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 critical, especially for small, depressed populations, such as CFPOs in Arizona.

Fires can affect CFPOs by altering their habitat (Abbate et al. 1999). A recent fire altered habitat near an active CFPO nest site (Flesch 1999) and although four mature saguaros in the area survived (at least in the short-term), post-fire mortality of saguaros has been recorded (Steenbergh and Lowe 1977 and 1983, Mclaughlin and Bowers 1982). Flesch (1999) also noted that approximately 20 to 30% of the mesquite woodland within 50 meters (164 feet) of the nest was fire- or top-killed, and ground cover was also eliminated until the summer monsoons. Careful use of prescribed fires in areas potentially suitable for CFPOs is necessary so that habitat is not lost or degraded (Flesch 1999).

Low genetic variability can lead to a reduction in reproductive success and environmental adaptability. Caughley and Gunn (1996) further note that small populations can become extinct entirely by chance even when their members are healthy and the environment favorable. The pairing of siblings or parents with their offspring, particularly in raptors, is rare, and has been documented in only 18 cases, representing 7 species (Carlson et al. 1998). Four of these species were owls: barn owls, burrowing owls (*Athene cunicularia*), screech-owls, and spotted owls (*Strix occidentalis*). In 1998 and 1999, two cases of sibling CFPOs pairing and breeding were documented (Abbate et al. 1999). In both cases, young were fledged from the nesting attempts. These unusual pairings may have resulted from extremely low numbers of available mates within

their dispersal range, and/or from barriers (including fragmentation of habitat) that have influenced dispersal and limited the movement of young owls (Abbate et al. 1999). Further, because the CFPO is nonmigratory, there may be an additional limitation on the flow of genetic material between populations which may reduce the chance of demographic and genetic rescue from immigration from adjacent populations.

Recent genetic research suggests that CFPOs in the action area may be isolated 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 owls in northwestern Tucson and the remainder of the state and Mexico may be indicative of natural divergence of this population from the rest of the CFPO population in Arizona. Specifically, this study found that CFPOs in northwestern Tucson are in a distinct clade and suggests a current separation between populations in northwestern Tucson and elsewhere in the state and Mexico. 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 CFPOs 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 population of CFPOs.

Environmental, demographic, and genetic stochasticity, and catastrophes have been identified as interacting factors that may contribute to a population's extinction (Hunter 1996). Environmental stochasticity refers to random variation in habitat quality parameters such as climate, nutrients, water, cover, pollutants, and relationships with other species such as prey, predators, competitors, or pathogens. Demographic stochasticity is uncertain due to random variation in reproductive success and survivorship of individuals. Genetic stochasticity is the random variation in gene frequencies of a population due to genetic drift, bottlenecks, inbreeding, and similar factors. Catastrophes are events such as droughts or hurricanes that occur randomly. When these factors interact with one another, there are likely to be a combination of effects, such that a random environmental change like habitat fragmentation can result in population and genetic changes by preventing dispersal. These factors are much more likely to cause extinction when a species' numbers are already extremely low. The small, fragmented population of CFPOs in Arizona may not have the ability to resist change or dramatic fluctuations over time caused by one or more of the factors mentioned above.

Soule (1986) notes that very small populations are in extreme jeopardy due to their susceptibility to a variety of factors, including demographic stochasticity, where chance variations in birth and death rates can result in extinction. A series of environmental changes, such as habitat reduction, reduce populations to a state in which demographic stochasticity takes hold. In small populations such as with the CFPO, each individual is important for its contributions to genetic variability of that population. As discussed above, low genetic variability can lead to a lowering in reproductive success and environmental adaptability, affecting recovery of this species.

In close proximity of the project site (within 0.25 mile), a territorial male CFPO has been documented since the fall of 1999. This male has remained in this territory within the same general area west of Thornydale Road since that time. AGFD placed a radio transmitter on this owl in the spring of 2001, and continues monitoring it. In early September 2001, a transmitted juvenile female CFPO dispersed from its nest to the northwest of the project site and paired with this resident male. AGFD continued to monitor this pair until late September 2001, when the female was found dead of apparent cat predation (S. Richardson, Arizona Game and Fish department, pers. unpubl. data). All relocations of the resident male prior to its pairing with the female owl in September 2001, while it was paired, and since the female's death have been west of Thornydale Road and south of Cortaro Farms Road (S. Richardson, Arizona Game and Fish department, pers. unpubl. data).

Other CFPO sites in the vicinity include: three currently active CFPO nests within approximately 2.25 miles of the project site; a long time nest site that was last active in 1999 approximately one-half mile away; two other nests within approximately 2.5 miles and two miles, last active in 1998 and 2000 respectively; and two other sites approximately 1.5 miles away last active in 1996 and 1997.

III. 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). The EPA has determined the action area to be approximately 1.6 miles of Thornydale Road, from Ina, north to approximately 800 feet north of Cortaro Farms Road and associated side roads (Figure 1 of BA). We disagree with this determination. The Service has determined the action area to include the project site⁸ and areas within 19 miles of the project site. We based this determination on the dispersal distance of juvenile CFPOs in Texas and Arizona (G. Proudfoot unpubl. data, S. Richardson, Arizona Game and Fish Department unpubl. data). With so few individual CFPOs in Arizona, the maximum dispersal distance may be periodically needed to maintain genetic interchange between groups of owls. This is particularly important when there is a limited gene pool available. On two separate occasions in the action area, siblings of the same nest were

⁸ The Service defines the project site as Thornydale Road (north of Magee Road) north to approximately 800 feet north of Cortaro Farms Road, and sections of Magee and Cortaro Farms roads. The portion of Thornydale Road south of Magee Road is already highly developed and the Service has concurred with the COE determination that this portion of the project was not likely to adversely affect the CFPO, therefore, this portion of the project is not considered in this consultation.

documented breeding with each other the following year (Abbate et al. 1999) (see Range wide Trend section below). Instances of sibling breeding may be a reflection of small isolated populations of owls, and maintaining genetic diversity within depressed populations is important to maintain genetic stochasticity and fitness. AGFD (unpubl. data) has documented movement between CFPOs in southern Pinal County and northwestern Tucson, therefore, maintaining this genetic interchange is important. Therefore, we define the action area to include areas containing known owls within northwestern Tucson and southern Pinal County as identified above.

The project site (i.e., project footprint) is within the Arizona Upland Subdivision of the Sonoran Desertscrub vegetation community (Brown 1994). 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 to Altar, 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 (*Cercidium floridum*), foothills paloverde (*C. microphyllum*), ironwood (*Olneya tesota*), mesquites (*Prosopis* spp.), and cat-claw acacia (*Acacia* spp.). Cacti of many species are found within this subdivision, and include many varieties of cholla and prickly pear (*Opuntia* spp.), fish-hook barrel cactus (*Ferocactus wislizenii*), and compass barrel cactus (*F. acanthodes*) (Brown 1994).

The project site is within the paloverde-cacti-mixed scrub series of the Arizona Upland Subdivision of the Sonoran Desertscrub community. 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.

Over the past 12-month period, we have conducted over approximately 100 informal section 7 consultations within the action area (e.g., capital improvement projects, residential, commercial, and other developments) that have either yet to undergo formal section 7 consultation, or those projects not likely to adversely affect the CFPO. In addition, we have provided technical assistance to approximately 500 individual projects without a federal nexus (i.e., projects not requiring a federal permit, authorization, or funding [e.g., develop single family residences, churches, fire stations, etc on individual lots]). These projects individually were not likely to adversely affect CFPOs, or their adverse effects were insignificant or discountable due to their location, size, and scope. Collectively however, these projects, particularly non-federal projects (i.e., without a federal nexus) have taken place since listing, and continue to occur in areas that are within known CFPO territories, dispersal corridors, and areas that are important for survival and recovery within the action area. The Service has provided technical assistance to many of these landowners and project proponents to reduce and minimize these adverse effects of their

projects by retaining suitable habitat on their parcel (generally limiting vegetation disturbance to 20% of their parcel and maintaining the remainder 80% in a natural condition) and providing connectivity for owl movement where possible. However, this assistance is not always requested, nor has it always been followed. Overall, suitable CFPO habitat in this area continues to be lost, and movement corridors continue to be affected.

Within the action area, Marana has experienced 467% growth and Oro Valley 310% growth from 1990-1999; the Arizona State Department of Economic Security stated that Marana is one of the two fastest growing communities in Arizona (The Arizona Daily Star 2000b). Housing starts in the area have continued to increase with Marana issuing over 1,000 permits for the first time in 1999 (The Arizona Daily Star 2000a). As increasingly more houses are built, commercial developments and capital improvements all continue to affect the survival and recovery of the CFPO. Pima County's population has grown from 666,000 in 1990 to estimates of at least 850,000 in 2000 or a 30% increase. This annual growth rate has varied from 15,000 to 30,000 persons each year, consuming at the present urban density approximately 7-10 square miles of Sonoran Desert each year (Pima County 2001). Also see Status section above for additional threats to the CFPO that have occurred since listing.

In addition, there have been several projects that have occurred, or are on-going at this time that have not undergone formal section 7 consultation with a federal agency. In December 1999, approximately 40 acres were graded for the Amphitheater High School site in northwestern Tucson. We did not receive a request for consultation on this activity prior to grading. Since that time, there have been four other federally permitted projects⁹ that we are aware of within the project area that have resulted in (or are currently causing) the destruction of approximately 550 acres of suitable habitat without undergoing section 7 consultation. This has further reduced the amount and availability of suitable habitat and movement corridors within the action area.

We have completed livestock grazing consultations with the USDA Forest Service and Bureau of Land Management (BLM) in southern and central Arizona that addressed adverse impacts to CFPOs. These projects have adversely affected suitable habitat from continued livestock grazing and associated gathering activities. Also, within the project area we have completed several other consultations with the EPA and COE: In July 2000, we completed a consultation with the EPA for a 20-acre residential development (Countryside Vistas Blocks 5 and 6) approximately 1.5 miles to the west of the project site. In October 2000, we completed a consultation with the EPA for a 5,924-acre residential and commercial development (Dove Mountain) approximately 4.5 miles to the northwest of the project site. In December 2000, we completed a consultation with the EPA for a 29-acre residential development (Tecolote de Oro) approximately two miles to the northeast. In July 2001, we completed a consultation on the 7-acre Crescent Ridge Apartments, approximately one mile to the north of the project site. On December 2001, we completed a consultation on a 420-acre residential development with open space conservation areas, approximately 3 miles to the northwest of the project site and school improvement project approximately one mile to the north of the project site. We have also completed consultations on

⁹ Section 402 and/or 404 permits under the CWA issued by the EPA and COE, respectively.

several smaller projects including a utility substation, water recharge facility, recreation facility, and 5-year hiking trail work plan. For each of these projects, suitable CFPO habitat will be removed; however, they all incorporated conservation measures that, are consistent with the best scientific and commercial information available and consistent with draft recommendations of the Technical Group of CFPO Recovery Team. These measures maintain connectivity and movement corridors through the affected areas, and provide suitable habitat at levels consistent with those where successful breeding owls have occurred elsewhere within the action area (e.g., maintaining a 20-25% vegetation disturbance level [see discussion below for this analysis]). All of these consultations resulted in no jeopardy and no adverse modification of critical habitat (which was designated at that time) determinations by the Service.

In December 1998, an ESA section 10(a)(1)(B) permit for the CFPO was issued by the Service for a guest ranch (Lazy K Bar) which may eventually be converted to low density residential housing in northwestern Tucson. This project contained conservation measures to minimize adverse effects that were based on the best available information at that time. Although breeding, sheltering, and foraging were adversely affected, their functions and movement of CFPOs through this area were maintained. Pima County is currently working with the Service on developing a county-wide multi-species habitat conservation plan (i.e., Sonoran Desert Conservation Plan [SDCP]) which, if approved, will result in the issuance of a section 10(a)(1)(B) permit (i.e., Habitat Conservation Plan [HCP]) to Pima County and other participating jurisdictions for not only CFPOs but also potentially several other listed and sensitive species. We are currently working with other applicants on two additional HCPs in the action area consisting of residential and commercial developments ranging from 300 to 500 acres in size.

Several thousand acres of State Trust land are located in a large continuous block immediately to the north and west of the project site. This land contains suitable CFPO habitat. Surveys in this area have not been comprehensive, but there is documentation of dispersing juveniles moving through the area. Nests have not been documented in this area, but this may be due to the low level of survey efforts to date. At present, this land is not developed. 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.

South of Magee Road is highly fragmented and developed, consisting primarily of high density residential and commercial developments. North of Magee Road along Thornydale Road is a mix of undeveloped and developed land, zoned low density (one house per 3.3 acre) residential (suburban ranch (SR) and suburban homestead (SH); high density residential (up to 7 houses per acre); and commercial development. Within the project site, the corner of Thornydale and Cortaro Farms roads consists of a large commercial shopping mall on the southeast corner, and convenience stores and gas stations on the northeast and southwest corners. There are blocks of undeveloped land containing suitable CFPO habitat on either side of Thornydale Road, north of Magee Road and, approximately 0.5 mile to the north of Cortaro Farms Road is the 500-acre Arthur Pack Park, which is largely undeveloped and suitable habitat for the owl.

CFPOs were first documented in the action area around 1872 (see Status and Distribution section above) and historically were widespread in the action area. Collections of CFPOs were fairly

regular in this region compared to elsewhere in the state until 1918 (Johnson et al. in prep.). Only one CFPO observation was recorded between 1918 and the 1970's (Hunter 1988, Johnson et al. in prep.). Several sightings of CFPOs were documented during the 1970's in the Tucson Basin; however, systematic surveys did not take place until 1993 by AGFD. Survey efforts in this area have dramatically increased since listing, particularly in the last 4 years (U.S. Fish and Wildlife Service unpubl. data). In addition, AGFD initiated radio telemetry research in the action area in 1998, which has provided valuable information on habitat use and movement patterns of adult and juvenile CFPOs.

The action area supports one of the highest known concentrations of breeding CFPOs in the state. Since 1997, there have been ten confirmed CFPO sites (i.e., nest sites and resident male territories) within 3 miles of the project site; of those CFPO sites, three have been within one mile of the project site. Seven of these ten owl sites have been nest sites (S. Richardson, Arizona Game and Fish Department unpubl. data, U.S. Fish and Wildlife Service unpubl. data). The project site has had a resident male CFPO present since the fall of 2000, and most recently in early September 2001, a juvenile CFPO dispersing from a nearby nest site joined this male in its territory. AGFD monitored this juvenile female using radio telemetry as it dispersed from its natal area, and as it moved from the Arthur Pack area and ultimately paired with the resident male south of Cortaro Farms Road. As noted above, this pair remained together until the female was found dead, apparently from cat predation. AGFD and the Service will continue to monitor the location, use area, and breeding status of the remaining male and other CFPOs in the project area.

We currently know of only a small population (8 adults in 2001) of CFPOs in the action area (northwestern Tucson and southern Pinal County). However, the information regarding owl use in the action area, and particularly the vicinity of the project site, represents only limited data, collected primarily over the past few years. For example, use of radio telemetry equipment, which provides detailed information on use patterns and areas was not utilized until 1998, and its use has been limited by the small number of birds transmittered and available resources (i.e., limited personnel for intensive monitoring and equipment). In addition, battery life on radio transmitters is limited to only 90 days because of the small size that must be used on these small owls, which further limits the amount of telemetry data that can be collected.

Current information suggests that CFPOs can live and breed successfully in areas which have undergone at least some degree of low density human development; however, they do not appear to be able to tolerate all types of development, particularly high density development. Since widespread surveys began in Arizona in 1999, more owl sites have been documented in areas with little or no human activity or development. For example, in 2001, of the 29 known CFPO sites in the state, 24 sites (83%) were in undeveloped areas with very little human activity, compared to only 5 sites (17%) that were in areas with some level of low density development (S. Richardson, Arizona Game and Fish Department unpubl. data, U.S. Fish and Wildlife Service unpubl. data). No CFPOs have been documented in high density commercial or residential developments. Of the known nest sites in 2001, 14 (82%) of the 17 nest sites were in undeveloped areas with little or no ground disturbance or human activity.

To determine the level of vegetation disturbance nesting CFPOs may be able to tolerate, a group of CFPO experts recently completed an analysis of all known 2001 and earlier nest site home ranges (n=9) occurring in developed areas in northwestern Tucson that successfully produced offspring. They calculated the amount of vegetation disturbance (e.g., roads, buildings, horse corals, pastures, parking lots, golf courses, etc.) within the estimated home range (280 acres) at each nest site. They calculated their average percent disturbance to be 23% (also the median). However, 5 of the 9 home ranges (55%) had levels below that average and 6 of the 9 sites (66%) were at or below the 25% disturbance range. This, when added to the total number of nesting CFPO breeding sites in the state as indicated above, indicates the selection preference of CFPOs to areas with very little or no human development. In addition, because the majority of surveys are conducted in areas already with some level of development as a result of a proposed project, these areas are sampled in higher proportion to areas with no current or planned development, potentially under sampling areas without development.

Differences in the tolerance of vegetation disturbance between breeding and non-breeding owls are important because nesting owls are necessary for recruitment of young owls and demographic support to achieve recovery of the CFPO in Arizona. Although also important to the population from a demographic standpoint, non-breeding males do not directly contribute to the increase of the population by producing young. Therefore, the Service and Technical Group of the Recovery Team believe that because successful breeding sites are necessary to produce offspring for the survival and eventual recovery of the CFPO Arizona population, vegetation disturbance levels found at breeding sites should be used as guidelines rather than those in non-breeding territories. These guidelines are particularly important within specific areas of the state recommended by the Technical Group of the Recovery Team as Special Management Areas (SMAs). The project site (north of Magee Road) is within the proposed Northwest Tucson SMA.

It should be noted that one of the nest sites with the highest amount of vegetation disturbance (33%) is that of a long established pair that was documented from 1997 through 1999. Development in the general vicinity of this site continued during this time. As noted above, the male of this pair was found dead in 1999. Surveys in 2000 and 2001 did not locate any CFPOs at this site, therefore it remains inactive. Site tenacity in the short-term may have been a factor in this pair's ability to withstand this higher level of vegetation disturbance compared to other sites in Arizona; however, the long-term effect of this amount of disturbance is unknown. There were three new nest sites¹⁰ in 2001 with disturbance levels of 21%, 30%, and 34% (S. Richardson, Arizona Game and Fish Department, Unpubl. data). Each of these territories successfully produced fledglings that dispersed to other areas in 2001. This is the first year these three sites were reproductively successful, and it is unknown whether they will be able to continue to remain in these territories in subsequent years. As indicated above, two of these new nest sites, together with the other nest site that has been inactive since 1999 are at the extreme range of the amount of development occurring within all other CFPO nesting territories in Arizona (greater than 30% disturbance).

¹⁰ Both were resident male CFPOs establishing territories in the fall of 1999, remaining at their respective sites until paired with females in the spring of 2001.

There also appears to be a difference in the tolerance to the amount of vegetation disturbance (i.e., development) between nesting and non-breeding CFPOs. Single owls may be able to tolerate higher levels of development and more marginal habitats, while breeding owls may need less disturbed vegetation within their home ranges. An analysis of all known CFPO sites in northwestern Tucson resulted in a considerably lower amount of vegetation disturbance at nest sites compared to non-breeding sites (e.g., unpaired males) (S. Richardson, Arizona Game and Fish Department unpubl. data). As stated above, the average amount of vegetation disturbance within the home range of 1998-2001 nesting sites in developed areas was 23%. The amount of vegetation disturbance within the home range of non-breeding sites in developed areas was considerably higher, averaging 37% during the same period. Although these overall results are based on a small sample size, they represent the best available information and indicate that nesting CFPOs may require less disturbed areas than unpaired owls. For example, a juvenile male CFPO established a new territory in the fall of 2000 within one-quarter mile of the project site, which is surrounded on three sides by highly developed residential and commercial properties. This male has remained there throughout the 2000 and 2001 breeding seasons and failed to pair with a female owl, even after vigorous calling throughout the spring and summer months both years. In September 2001, a juvenile female CFPO dispersed from its nest and paired with this resident male. They remained together for approximately 2 weeks until the female was found dead, apparently as a result of cat predation. At this time, the male remains unpaired. Within this territory the habitat is highly fragmented, containing the highest degree of development (approximately 50%) of any other known CFPO territory (S. Richardson, Arizona Game and Fish Department unpubl. data.). It is unclear whether the amount of development and vegetation disturbance is too great for successful breeding. The Service and AGFD will continue to monitor this owl, using radio telemetry and direct observations.

The Service recognizes that even though there have been some nesting territories in the upper range of disturbance, other factors also play an important role in developing a recovery strategy for this species. For example, these data represent a very limited sample size for breeding sites within developed areas (n=9); little is understood regarding the long-term effects of increasing levels of development occurring within nest sites in higher developed areas and how this will affect their suitability for breeding and movement in the future; and the potential cumulative effects that increasing levels of development have on owls in this region are not fully understood. The long-term productivity and success of breeding sites in these higher disturbed areas is unknown. In 2001, all of the nest sites were in new areas, resulting in a relatively large proportion (67%) of sites where nesting had occurred in the past, but were inactive in 2001 (S. Richardson, Arizona Game and Fish Department unpubl. data). More research and monitoring is needed to better understand habitat needs and the long-term relationship between development and CFPO requirements.

The Technical Group of the Recovery Team has preliminarily recommended Recovery Areas that they believe are necessary for the survival and recovery of the CFPO in Arizona. Pertaining to this project, the project site (including all work along Magee Road, Thornydale Road north of Magee, and Cortaro Farms Road) are within recommended Recovery Areas. The Technical Group also has initially recommended specific areas within Recovery Areas as Special

Management Areas (i.e., SMAs) that are of the highest concern because: (1) they contain relatively high concentrations of CFPOs, particularly nesting owls, that are important sources of young owls to increase the population; (2) CFPO recovery is dependent on the availability of suitable habitat near breeding areas not currently known to have owls where juvenile owls can disperse into and successfully breed; and (3) they are threatened by rapid urban development or other immediate threats. Within the action area, two SMAs have been initially recommended: (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 entire project site under consultation is within the Northwest Tucson SMA. Therefore, based on the best available information, it recommends a maximum of 20% vegetation disturbance guideline (instead of the 23% average/median) is used for this SMA within this portion of Recovery Area 3, for the survival and recovery of the CFPO.

Limiting the amount of vegetation disturbance to 20% on a project level is imperative in these two SMAs because of their importance; however, these levels do not necessarily need to be applied universally to all Recovery Areas. Although all areas within Recovery Areas are essential to the survival and recovery of the CFPO, the role and relative importance of each specific area must be assessed individually for each project under section 7 consultation. For example, some areas were identified to provide connectivity for movement between subpopulations of known owls or suitable habitat. Others are of higher importance because they have nesting owls and provide areas for recruitment near active nests for the establishment of new breeding pairs. SMAs are recommended as highest importance for recovery of this subspecies, and therefore, are recommended for the most conservative management guidelines based on the best available information. Conservation measures (e.g., open space acquisitions, land trades, conservation easements, and other conservation efforts) should be focused in SMAs, particularly the Northwest Tucson SMA which contains the highest number of known breeding owls and is of the highest immediate risk from development. Recovery Areas outside SMAs are still important for the survival and recovery of the CFPO; however, their role is different than that of SMAs and higher levels of disturbance may be acceptable.

The project site contains suitable habitat providing foraging, sheltering, movement, and dispersal habitat for the CFPO. Because of the amount of intensive human activity (high traffic volume and commercial developments), nesting is not expected to occur within the actual footprint of this project within the roadway rights-of-way (ROW).

IV. EFFECTS OF THE ACTION

This proposed action will remove approximately 8.9 acres of Sonoran Desertscrub vegetation which provides foraging, sheltering, and movement/dispersal habitat for CFPOs. Because of its immediate location to high volume traffic areas (i.e., Cortaro Farms and Thornydale roads) and nearby commercial development, and based on radio telemetry data collected by AGFD, the project site (i.e., project footprint of roadway including pavement, drainage work, ROW etc.) is not expected to be used by CFPOs for nesting; therefore no nesting habitat will be removed.

Currently, the amount of ground disturbance within the CFPO territory directly affected by this project is estimated to be approximately 50% (S. Richardson, Arizona Game and Fish Department unpubl. data). The removal of approximately 6.3 acres of suitable habitat has already occurred with the November 2000 clearing, and an additional 2.6 acres would be cleared upon completion of this section 7 consultation and issuance of section 402 and 404 permits from the EPA and COE, respectively (totaling 8.9 acres for the entire project).

Although the County will clear approximately 8.9 acres of vegetation that is currently providing foraging, sheltering, and movement habitat, about 7.5 acres will be revegetated with a substantial number of trees, shrubs, cactus, and ground cover, thereby reducing adverse effects from the project substantially. As a result, some habitat values (i.e., foraging and sheltering) may redevelop as vegetation matures, although there will still be some decreased value. A permanent loss of approximately 1.4 acres of foraging, sheltering, and movement/dispersal habitat will occur within areas to be paved, or other areas that will be void of trees and shrubs. The County will plant additional trees on approximately 1.8 acres that are within drainage ways, but outside of graded or otherwise disturbed areas (Figures 1a, 1b, and 1c in BA). These plantings will increase the density of trees in those sparsely vegetated areas by enhancing the vegetation cover and screening on either side of these roadways, minimizing adverse effects to the CFPO. In addition, approximately 1.7 acres of land that was previously void of vegetation prior to the November 2000 clearing will be revegetated with trees, shrubs, cactus, and ground cover. This will further reduce the amount of bare ground present and provide increased cover and screening. The County will drip irrigate all plants in planted areas to ensure their establishment, provide maintenance and pruning to maintain their health and vigor, and monitor them on a regular basis. This extensive revegetation program will minimize the loss of suitable habitat and will provide some habitat functions (other than nesting habitat) in the future.

The project includes the removal of approximately 259 trees and shrubs that were previously removed on November 2000, and an additional 84 trees and shrubs are expected to be removed during future work¹¹. In addition, 295 saguaros (less than 6 feet tall) and 14 (greater than 6 feet tall) were removed in November 2000, and an additional 16 saguaros are yet to be removed. Of these additional saguaros that will be removed, 14 (88%) will be salvaged and transplanted. Approximately 825 15-gallon trees (i.e., blue palo verde, ironwood, mesquite, sweet acacia, desert hackberry), 477 5-gal woody shrubs, and 5,781 1-gallon non-woody shrubs planted on 15-20 foot centers will be planted on either side of roadways and within medians. Revegetation efforts by the County will increase the number of trees and woody shrubs five fold (502%) from the pre-existing condition prior to grading on November 2000. As a result, there will be significantly more trees and shrubs within the project site upon the completion of the project with the County's revegetation program. However, there will be a loss of some larger specimen trees and saguaros that were not salvaged during the November 2000 clearing. The County will utilize to the maximum extent possible large boxed specimen trees to provide the greatest amount of cover and screening possible. They will also plant specimen trees as close as possible to roads due to safety constraints, arranged in clumps at key owl movement corridors. Smaller

¹¹ See BA for detailed list of tree and shrub species removed and yet to be removed.

containerized trees and shrubs are expected to develop into large specimens within a few years that will provide increasing cover and screening. The County's active maintenance program (e.g., irrigation, pruning, etc) will ensure the survival of transplanted trees and shrubs. Although there will be a reduction in the number of large trees and saguaros present within the project site, as they develop, these habitat values will redevelop.

To offset the removal of approximately 8.9 acres of suitable habitat within the Northwest Tucson SMA, the County will obtain and put into conservation status in perpetuity for the CFPO, approximately 35.6 acres of Conservation Lands within the immediate vicinity of this project. The County has entered into a MOA (Appendix A) with the Service stating their commitment and the necessary assurances that these parcels will be obtained by the County for the intended purpose for CFPO conservation in perpetuity (Appendix B). Conservation Lands will be located in close proximity to the project site and will minimize adverse effects directly to the resident CFPO located in the vicinity. Parcels are of similar or higher value to CFPOs than that present in the project site, and they will provide not only foraging, sheltering, and movement habitat for owls, but also nesting habitat as well. In the event the County is unsuccessful in their purchase or condemnation efforts of these Conservation Lands, the County will obtain approximately 35.6 acres of land elsewhere within the territory of this owl and/or within its movement corridors which is acceptable by the Service under terms of this opinion, and as specified in the MOA.

The project site is near existing urban development, and a portion of the site is within a CFPO territory. There are undeveloped parcels immediately adjacent to the site and in the vicinity that provide breeding, foraging, sheltering, and dispersal habitat for CFPOs. This project will result in an increase in fragmentation and a reduction of habitat, although the conservation measures (e.g., reducing the area cleared, extensively revegetating areas, obtaining approximately 35.6 acres of off-site conservation lands to off-set the loss of habitat, and an active maintenance program to ensure plant survival) will substantially minimize additional fragmentation to the CFPO. To minimize fragmentation and the effects of habitat loss, the County will ensure that connectivity is maintained and sufficient habitat is retained. This is particularly important at this site since there currently is a CFPO territory that encompasses a portion of the project site. Because there are high-density residential developments to the west and south of this territory, the only means of owl movement, either by this owl, any potential mate, or future young is either across Cortaro Farms Road (west of Thornydale Road) or across Thornydale Road (between Cortaro Farms Road and Magee Road). Therefore, maintaining effective movement corridors through this area is essential. The County has designed the project to narrow the openings (between tree canopies) on either side of the roadways and increased the plantings of trees within the medians in important areas such as washes and upland areas to maintain these linkages and connectivity for owl movement across Magee, Thornydale, and Cortaro Farms roads (Figures 3, 1a, 1b, and 1c of the BA).

The County has designed the proposed improvements to these roads to minimize adverse effects to existing natural vegetation, primarily due to modifications to the drainage improvements along the east side of the roadway and at the drainage crossings. As a result, trees and other plants will be able to be placed closer to the roadway on the shoulder and to construct medians of suitable

width for revegetation. Similarly, the redesign of Magee and Cortaro Farms roads will enable Pima County to plant more trees on the shoulders of these roadways. These efforts will ultimately reduce CFPO flight distance and facilitate their movement and dispersal across them. Following revegetation, the anticipated CFPO flight distance from tree canopy to tree canopy¹² will be reduced to 40 feet or less along approximately 1,880 feet (62%) of Thornydale Road, including the areas adjacent to washes A, B, and C, along about 280 feet (23%) of Magee Road, and about 520 feet (38%) along Cortaro Farms Road. Approximately 2,680 feet of the 6,550 feet (1.24 miles) (41% of the total) of project site will have an opening width of 40 feet or less between trees.

As a result, the amount of roadway within the project site with openings suitable for owl movement will increase substantially with this project. Prior to the clearing on November 2000, only 28% of the project site had an opening width of 50 feet or less and the remaining 72% had openings of 100 feet or more. Upon completion of the revegetation efforts, the amount of openings less than 40 feet in width will be increased to 41%, resulting in a 13% increase from the preexisting condition of November 2000. This project will decrease the amount of roadway with relatively wide openings substantially because of the conservation efforts incorporated with this project, thereby increasing the area owls may be permitted to successfully cross these roads. Based to the best available information, this will ensure that connectivity will be maintained through the project site across Magee Road, Thornydale Road, and Cortaro Farms Road. It will be essential that the County monitor future owl movement and evaluate the effectiveness of these measures to ensure these designs and measures meet their expected and intended goals.

In addition, the County will enhance areas that are sparsely vegetated by planting additional trees and shrubs within some portions of the easement. These restoration efforts will be concentrated on the east side of Thornydale Road in the vicinity of washes A and B, and on the east and west sides of Thornydale Road in the vicinity of Wash C. The County has also decreased left turn bay lanes, resulting in larger medians that provide potential movement corridors. Guardrails will also be installed at the face of the outside curb along Thornydale Road which will allow for tree plantings closer to the edge of the roadway that will minimize the distance that owls must fly to cross roads. The current speed limit of 45 mph will be reduced to 40 mph which will result in a lower possibility of owls being struck by vehicles.

As an interim measure during both the section 7 consultation and project construction, the County placed 175 boxed trees (36 to 48 inch boxes), including 70 ironwoods, 70 mesquites, and 35 blue palo verdes, in 35 clusters at strategic locations to provide cover and enhance the travel corridors for the owl along both Cortaro Farms Road and Thornydale Road. As evident by the recent successful movement of a juvenile CFPO from a nearby nest site to the south side of Cortaro Farms Road, these boxed trees, when placed at strategic locations may have been used by this owl as cover while dispersing across these roads. These trees will remain in place during the remainder of the construction period. The Service, County, and AGFD will continue to monitor the condition and placement of these trees to ensure these boxed trees will be placed in a configuration and locations that will provide for owl movement.

¹²Measured from edge of tree canopies in outer roadway to tree canopies in median strips.

Vegetation disturbance and activities that cause noise disturbances will be excluded within the off-site Conservation Lands obtained by the County. Management activities will be limited to only those approved by the Service and will be set forth for the benefit and conservation of the CFPO in perpetuity. Only activities that are conducive to the long-term conservation of the CFPO, such as movement corridors, breeding, foraging, and sheltering will be permitted within the Conservation Lands.

The use of pesticides potentially could affect CFPOs indirectly by reducing prey species (e.g., insects, reptiles, birds) within the CFPO home range and directly if not used in a controlled and targeted manner. Pesticides and fertilizers are used extensively to control undesirable plants and weeds. The County will exclude the use of all herbicides and insecticides (pesticides) and fertilizers within the project site and Conservation Lands, therefore, these adverse effects will not occur. The County will train their maintenance crews to improve the likelihood of survival of desirable trees and other vegetation and utilize an integrated pest management program that will ultimately benefit the CFPO.

The effects that non-directional and high intensity lighting has on CFPOs is unknown. However, anecdotal information of CFPOs in northwestern Tucson indicates that they may be able to tolerate at some level, low intensity lights, and particularly directional lighting. They have not been observed in areas that have a high number of high density or non-directional lights. The County will limit the use of high intensity lights to the intersections of Thornydale and Cortaro Farms Roads only. Because the current and expected high degree of human activity at these intersections, owl use is not expected at these locations. Therefore, because owls are likely to avoid these intersections already due to the current lack of habitat and high degree of human activity (e.g., vehicular traffic and commercial business located at 3 of the 4 corners), the installation of lights at this location is not expected to increase their exposure to predation or other threats.

The proposed action will also cause short-term noise disturbance associated with construction and long-term noise disturbance and increased human activity. Thornydale Road and Cortaro Farms Road currently experience high traffic volumes (19,475 vehicles per day in 1997) (SWCA 2001). The project is designed to ease congestion; however, the BA does not provide estimates of project volumes. Continued growth of the area is expected to continue to increase in the near future regardless of this project.

Based on the best available scientific information, it appears this species may be tolerant, at least to some extent, of certain low level noise disturbances associated with human activity. These disturbances include daily activities in residential areas such as people walking, voices, children playing, horses and other livestock, dogs, low to moderate vehicle and large truck traffic, and some occasional construction equipment activity. However, the threshold between noise levels and types of activities that an owl can tolerate versus those that will cause an owl to leave an area are not clearly known at this time.

With respect to CFPOs and noise disturbance at the project site, it is noted above that intensive human use in and around the site is on-going; however, activity levels will substantially increase in the short-term with construction activities. There will be no noise disturbance from heavy equipment (e.g., grading, paving, cutting, filling, hauling, heavy earthwork, clearing, grubbing, or work in culverts/storm drains) within one-quarter mile of a CFPO activity site or nest during the CFPO breeding season (February 1 to July 31). Only light construction activity (e.g. installation of water lines, utilities, traffic lights, surveying, and landscaping) will occur during this time to minimize any potential of noise disturbance to nesting owls. The County may continue with heavy equipment operation in this area outside of the breeding season. These measures will reduce the likelihood that noise will substantially affect breeding activities if they occur in the vicinity of this project. As a result, significant construction noise disturbances during this critical period will be substantially reduced.

We do not expect that any CFPO will be killed as a direct result of this project because of the measures to vegetate areas on either side of the roadways and medians and a reduction of speed limits which will facilitate successful owl through the project site.

Summary

Survival and recovery of the CFPO will require not only protection of all known sites, but also the conservation of other areas not currently known to have nesting owls, which can be measured at two spacial scales. At a large scale, connectivity is necessary among large blocks of suitable habitat that are either currently known to have nesting owls or are important for recovery. The project is located within the proposed Recovery Area 3, in particular, the Northwest Tucson SMA. This SMA, combined with the adjacent Tortolita Fan SMA, contain the highest number and density of breeding CFPOs known in Arizona. They also contain particularly important for the expansion of the population. Immediately to the south of the project site is high density commercial and residential development with little or no suitable CFPO habitat. Therefore, the project site is not vital as a link between Recovery Areas.

At a finer scale, the protection of habitat within the vicinity of known owl sites for establishment of new sites and movement between them is also essential. Connectivity between breeding and non-breeding owls and areas where juvenile owls can establish new nesting territories or replace owls as they die are essential for the conservation of the CFPO. This project will maintain, and in some respects enhance, the existing movement corridors. Movement corridors for the CFPO located to the north and east of the project site (and encompassing a portion of its territory) will remain and will be improved from the present condition. This will allow continued interchange of owls from this site to other areas to the north within northwestern Tucson. If breeding occurs, juvenile owls are expected to be able to move from their natal area elsewhere to join other owls and establish territories. AGFD documentation of CFPOs moving through relatively wide (200 feet and greater) existing wash corridors between high density developments in northwestern Tucson, and most recently, the owl dispersal across Cortaro Farms Road indicate that connectivity has been maintained during the suspended construction period, which will continue through the remainder of construction. A substantial increase (over 500%) in vegetation (e.g., trees, shrubs, cacti, and other vegetation) within the project site will provide adequate screening and cover for owls in the area and will allow for adequate movement through the project site.

The project will remove approximately 8.9 acres of suitable habitat, providing sheltering, foraging, and movement habitat for owls. Nesting is not currently occurring, nor is it expected in the future within the project site because of its close proximity to high human use areas. To minimize these adverse effects, approximately 35.6 acres of off-site Conservation Lands will be obtained by the County for the conservation of the CFPO. Management activities on these lands will be conducive with the conservation of the CFPO in accordance with measures that will be agreed upon by the Service. These lands are within and/or directly benefit this owl territory by providing nesting, foraging, sheltering, and movement habitat for the CFPO. We believe this approach to be consistent with the best available science and the intent of preliminary recommendations made by the Technical Group of the Recovery Team and Service for conservation of Arizona CFPO population.

V. CUMULATIVE EFFECTS

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

The action area is subject to ongoing residential and commercial development pressures, capital improvements, and state, local, and private actions are expected to continue development in the immediate vicinity of the project site and elsewhere in the action area. Any activity clearing five acres or more requires a NPDES section 402 permit under the CWA from the EPA, and activities occurring within jurisdictional waters and wetlands of the U.S. require a section 404 permit under the CWA from the COE. As a result, a substantial number of these anticipated projects will be subject to future section 7 consultations and are not considered. Many individual undeveloped parcels will not require a federal permit or other federal nexus and will continue to be built, and not subject to future consultation. For example, we have become aware of an estimated 500 private actions without a federal nexus¹³ (e.g., single family residences, churches, fire stations, etc) that have taken place within northwestern Tucson over the past 12 months. This is particularly important in the action area due to the large number of undeveloped small parcels zoned as SR and low density residential areas that, when developed, will further reduce the amount of suitable habitat, increase fragmentation, and degrade habitat conditions. Also, we are aware of at least 5 other projects greater than 5 acres in size within the project area that have initiated or completed grading of suitable habitat either without filing for a section 402 or 404 permit, or they have submitted a notice of intent (NOI) for a 402 permit with the EPA but not undergone section 7 consultation with the Service.

We are aware of many planned residential and commercial developments, schools, churches, etc. in the action area that may further reduce and fragment CFPO habitat in this area. As stated

¹³ Such as a section 402 or 404 permit under the CWA, or some other federal authorization or funding.

above (Species Distribution section), this area supports one of the highest known concentrations of CFPOs in the state (3 active nest sites in 2001). Additionally, this area is currently experiencing a rapid growth in new home sales. Since the listing of this distinct population segment in Arizona, housing construction has continued to increase in the Tucson area and this trend is expected to continue into the foreseeable future. For example, in May 1999, new-home closings were a record 467 units, higher than any other May within the past decade (The Arizona Daily Star 1999). In 1999, Tucson-area building permits were 10.9% more than in 1988, and topped 7,000 for the first time. Permits were highest in northwestern Tucson and, for the first time, Marana issued more than 1,000 permits, with a strong building trend expected to continue steady or increasing (The Arizona Daily Star 2000a). We have received, and continue to receive notification of numerous new housing subdivisions and commercial developments in this region as well. Many of these activities will require a federal permit or authorization, and may enter into consultation with the Service in the future. However, as stated above, some projects, are resulting in adverse effects to the CFPO and affecting the survival and recovery of the species but are not undergoing consultation. Therefore, these activities continue to reduce the amount of habitat and reduce possible movement corridors within the project area, further degrading the baseline condition. In addition, projects not having a federal nexus (such as single family residences) are expected to continue in undeveloped areas within the project area until build-out, which will further affect the survival and recovery of the CFPO if not done in a manner that maintains a high proportion of natural open space that is available for use by CFPOs.

VI. CONCLUSION

After reviewing the current status of the CFPO, the environmental baseline for the action area, the effects of the proposed capital improvement, and cumulative effects, it is the Service's biological opinion that the proposed action is not likely to jeopardize the continued existence of the CFPO. There currently is no critical habitat for the CFPO, therefore none will be affected. These conclusions are based on the record of this consultation including the BA, project description and the following:

1. Conservation measures will be implemented to minimize noise and vegetation disturbance within the project site.
2. The loss of 8.9 acres of suitable habitat will be offset with the protection of 35.6 acres of Conservation Lands (under a MOA - Appendix A) managed for CFPO conservation purposes. These lands will be managed in a manner that will protect suitable habitat for the CFPO and contribute to its conservation.
3. CFPO habitat connectivity within the project site to adjacent suitable habitat areas and offsite Conservation Lands will be maintained.
4. If Conservation Lands other than those identified by the County and approved by the Service (Appendix A) are utilized, they will have prior approval of the Service to ensure they adequately offset impacts of this action.

5. Conservation Lands will provide habitat suitable for breeding, sheltering, feeding, and movement.
6. Conservation Lands will be located within the affected CFPO territory and or the immediate movement corridors as defined by radio telemetry studies.
7. Management of the offsite Conservation Lands will be conducive to the CFPO by limiting those activities that might adversely affect the owl in perpetuity (Appendix B).

INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and federal regulation pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm is further defined by the Service 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 by the Service 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 section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA 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 EPA and COE so that they become binding conditions of any grant or permit issued to the County, as appropriate, for the exemption in section 7(o)(2) to apply. The EPA and COE have a continuing duty to regulate the activity covered by this incidental take statement. If the EPA and COE (1) fail to assume and implement the terms and conditions or (2) fail to require the County 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 County must report through the EPA the progress of the action and its impact on the species to the Service 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 cause any take in the form of harm, death, or injury of any CFPO. The project site is within a portion of a resident male CFPO's home range (600 meters [0.37 mile]). This male was recently paired with a female owl for about a two-week period in September 2001, until she was found dead of apparent domestic cat predation. It is unknown whether another female owl will again pair with this male and breed;

however, it is possible. If so, CFPOs and their young could be affected by construction noise, dust, traffic, or other human activity in connection with the construction of these capital improvements. This project includes conservation measures such that the Service does not anticipate that these activities will constitute incidental take. Generally, we believe that the conservation measures adopted by the County as a result of this consultation, will reduce any CFPO effects below take. However, it is possible that non-lethal incidental take (in the form of harassment only) of this CFPO will occur within a 600-meter (0.37-mile) radius of its activity center as the result of ongoing construction activity.

Effect of the take

In the accompanying biological opinion, the Service determined that this level of anticipated take is not likely to result in jeopardy to the species when the following reasonable and prudent alternatives are implemented.

Reasonable and Prudent Measures

Pursuant to section 7(b)(4) of the ESA, Service believes the following reasonable and prudent measures are necessary and appropriate to minimize incidental take of the CFPO:

1. Minimize vegetation disturbance, loss of key habitat components, and other potential adverse effects to CFPOs within the estimated home range of the resident single or CFPO pair.
2. Minimize noise disturbance immediately adjacent to a CFPO nest or activity center.
3. Promote connectivity to allow for movement within CFPO home ranges, between CFPO sites and adjacent suitable habitat within the project site and Conservation Lands.
4. Monitor construction activities during and after completion of the project to ensure compliance with the terms and conditions listed below and to determine their effectiveness to accomplish their stated goals. Report the findings of this monitoring to the Service and corrective measures that will be taken if measures are not met and desired goals are not achieved.

Terms and conditions

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

Terms and conditions necessary to implement reasonable and prudent measure 1:

Minimize vegetation disturbance, loss of key habitat components, and other potential adverse effects to CFPOs within the estimated home range of a pair or resident single CFPO.

- 1.1 Because this project will take more than one year to complete, there is a potential that CFPOs may move into or around the project site. In addition, the breeding status of this owl may change. To determine the status of this owl and its breeding status, the County shall coordinate closely with the Service and AGFD in regard to the status of this CFPO site and others that may be present in the future. This may include the County conducting protocol surveys (using the Service's approved survey protocol in effect at the time of such activity) prior to continuing construction activities if AGFD cannot continue their research and monitoring efforts. The Service, in coordination with AGFD, shall determine whether a CFPO activity center or nest site exists and whether a change in status (i.e., abandonment) is appropriate, using the best available information, including survey detection and telemetry data (if available), and other monitoring information.
- 1.2 If the Service or County become aware of a new CFPO nest or activity center on or within 600 meters (0.37 mile) of the subject property, or a change in the location of the existing owl activity center, they shall immediately notify each other. There shall be no additional clearing of vegetation within this area until the Service, federal agency, and County conduct a site specific analysis regarding this new information, and the effects of ongoing and proposed activities to the CFPO.
- 1.3 There shall be no removal of a nest site and no land clearing or development activity within a 100-meter (330-foot) radius of a nest or resident CFPO activity center year-round.
- 1.4 Only directional and low intensity lights shall be used within 100 meters (330 feet) of a nest site or activity center to minimize adverse effects to resident CFPOs.
- 1.5 The County shall provide educational information to construction crews and otherwise limit their activity to the project site footprint only. The purpose of the educational information is to inform crews of these terms and conditions, to minimize vegetation disturbances to CFPOs, and to ensure maintenance of job site perimeters.
- 1.6 The County shall adhere to the Habitat Management Plan (Appendix B), which addresses acceptable and prohibited uses and management actions. Vegetation disturbance and other activities (e.g., plant salvage, ORV, motorbike use/racing, firearm target practicing, jeep tours, and application of insecticides and herbicides etc.) that might significantly degrade CFPO habitat shall be restricted within all Conservation Lands.
- 1.7 The Service and the County shall review development plans within 600 meters (0.37 mile) of a nest or activity center and ensure that habitat retained has an appropriate amount and configuration of constituent elements for a CFPO within its 280-acre home range.

- 1.8 Broadcast application (but not direct application within a golf course) of insecticides and herbicides shall be restricted within the estimated home range (600-meter [0.37-mile] radius) of a CFPO nest or activity center to minimize effects to nesting and resident owls and their prey base.
- 1.9 Appropriate measures shall be taken to ensure the utility ROW remains closed to all unauthorized motorized use.

Terms and conditions necessary to implement reasonable and prudent measure 2:

Minimize noise disturbance immediately adjacent to a CFPO nest or activity center.

- 2.1 Land clearing, heavy equipment operation, and blasting shall be prohibited within a 400-meter (0.25-mile) radius of a CFPO nest or activity center during the breeding season (February 1 through July 31).
- 2.2 The County shall coordinate as necessary with the Arizona Game and Fish Department to minimize noise disturbances that could disturb breeding and non-breeding CFPOs.
- 2.3 Blasting, land clearing, or other construction activity which has a greater noise intensity than such activity shall occur outside of the breeding season (February 1 through July 31) within a 400-meter (0.25-mile) radius of a nest or activity center.
- 2.4 The County shall minimize all human activities in all areas designated as Conservation Lands that may cause substantial noise disturbances that could disturb breeding and non-breeding CFPOs.

Terms and conditions necessary to implement reasonable and prudent measure 3:

Promote connectivity to allow for movement within CFPO home ranges, between CFPO sites and adjacent suitable habitat within the project site and Conservation Lands.

- 3.1 Vegetative screening and buffers (i.e., plant native tree species) shall be planted and maintained along identified owl movement corridors as identified in Figures 1a, 1b, and 1c of the BA to provide visual and noise screening except as set forth in this opinion.
- 3.2 During on-going construction activities, the County shall utilize large boxed trees arranged in clumps located at strategic locations as identified by the Service (e.g., across Cortaro Farms Road west of Thornydale Road and Thornydale Road along Washes A, B, C, and north of Cortaro Farms Road) to provide vegetative cover for CFPO movement across these roads during the construction period.

Terms and conditions necessary to implement reasonable and prudent measure 4:

Monitor construction activities during and after completion of the project to ensure compliance with the terms and conditions listed below and to determine their effectiveness to accomplished their stated goals. Report the findings of this monitoring to the Service and corrective measures that will be taken if measures are not met and desired goals are not achieved.

- 4.1 If a nest or activity center is located within a 400-meter (0.25-mile) radius of the project site, the County shall employ an onsite monitor during construction in order to ensure compliance with the terms and conditions of the ITS.
- 4.2 The County shall submit to the Service monthly (by the end of each month until construction and revegetation activities are completed) written report and maps to keep the Service informed of the status of activities (e.g. CFPO surveys, ongoing and completed construction phases, etc.) and compliance with these terms and conditions. In addition, the County shall seek technical assistance from the Service in implementing these terms and conditions in a manner most effective for minimizing CFPO impacts.
- 4.3 Within the project site, protocol surveys shall continue as necessary throughout the construction phase (see 4.2). In addition, surveys and monitoring of the Conservation Lands shall occur bi-annually to provide information on owl usage of these areas.
- 4.4 As funding allows, AGFD will continue to monitor CFPOs in the vicinity of the project site using radio telemetry. If AGFD is unable to continue these efforts, the County shall monitor any CFPOs within the project vicinity to determine whether owls are using the area, and to measure the effectiveness of the conservation measures contained herein. Monitoring shall continue until transplanted trees and shrubs have matured. The County shall coordinate with the Service and AGFD in these efforts. This information shall be used in subsequent capital improvement projects.

The Service believes that non-lethal incidental take (in the form of harassment only) of a pair or a resident single CFPO could occur because the project site is within a known owl territory. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, this level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The federal agency must immediately provide an explanation of the causes of the taking and review with the Service the need for possible modification of the reasonable and prudent measures.

The Fish and Wildlife Service will not refer the incidental take of any migratory bird or bald eagle for prosecution under the Migratory Bird Treaty Act of 1918, as amended (16 U.S.C. §§ 703-712), or the Bald and Golden Eagle Protection Act of 1940, as amended (16 U.S.C. §§ 668-668d), if such take is in compliance with the terms and conditions (including amount and/or number) specified herein.

Disposition of Dead or Injured Listed Animals

Upon finding a dead or injured threatened or endangered animal, initial notification must be made to the Service's Division of Law Enforcement, Federal Building, Room 8, 26 North McDonald, Mesa, Arizona (602/261-6443) 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 Fish and Wildlife Service or AGFD office, educational, or research institutions (e.g., University of Arizona in Tucson) holding appropriate state and federal permits.

Arrangements regarding proper disposition of potential museum specimens shall be made with the institution before implementation of the action. A qualified biologist should transport injured animals to a qualified veterinarian. Should any treated listed animal survive, the Service 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 CFPO. In furtherance of the purposes of the ESA, we recommend implementing the following discretionary actions:

1. The EPA and COE should conduct or fund studies using both monitoring and telemetry, to determine CFPO habitat use patterns and relationships between owls and the human interface in northwestern Tucson. Surveys involving simulated or recorded calls of CFPOs require an appropriate permit from the Service. AGFD should also be contacted in regard to state permitting requirements.
2. The EPA and COE should continue to actively participate in regional planning efforts, such as Pima County's SDCP, and other conservation efforts for the CFPO.
3. The EPA and COE should assist in the implementation of recovery tasks identified in the CFPO Recovery Plan when approved by the Service.

REINITIATION NOTICE

This concludes formal consultation on the project site within the Thornydale Road Improvement project in Pima County, Arizona. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the

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action has been maintained (or is authorized by law) and if: (1) any incidental take not authorized herein occurs, (2) new information reveals effects of the agency action that may adversely 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 way that causes an effect to a 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 this action. In instances where any incidental take not authorized herein occurs, any operations causing such take must cease pending reinitiation.

Effects to the CFPO that are outside of the parameters specified in the Conclusion Section of this opinion will require a case-by-case analysis to determine if reinitiation of consultation is necessary. If reinitiation is necessary, the Service shall expeditiously consult with the EPA and County to resolve any concerns related to the CFPO and to determine what, if any, measures are needed to minimize potential adverse effects to the CFPO.

We have assigned log number 2-21-00-F-213 to this consultation. Please refer to that number in future correspondence on this consultation. Any questions or comments should be directed to me or Mike Wrigley at (602) 640-2720 or Sherry Barrett at (520) 670-4617.

Sincerely,

/s/ David L. Harlow
Field Supervisor

cc: Assistant Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
C.H. Huckelberry, Pima County Administrator, Tucson, AZ
Army Corps of Engineers, Phoenix, AZ (Attn: Robert Dummer)
Arizona Game and Fish Department, Region 5, Tucson, AZ (Attn: Scott Richardson)

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Appendix A

**MEMORANDUM OF AGREEMENT BETWEEN
UNITED STATES FISH AND WILDLIFE SERVICE
AND
PIMA COUNTY, ARIZONA
FOR THE ACQUISITION OF MITIGATION LANDS
FOR THORNYDALE ROAD IMPROVEMENTS**

This MEMORANDUM OF AGREEMENT (“Agreement”), made and entered into as of the ____ day of _____, 2002, by and between PIMA COUNTY, ARIZONA (County), and the UNITED STATES FISH AND WILDLIFE SERVICE (“FWS” or the “Service”), hereinafter collectively called the “Parties,” defines the Parties' roles and responsibilities and provides a common understanding of actions that will be undertaken to avoid, minimize, and mitigate the effects of the County’s improvements to Thornydale Road (Road) on the Cactus Ferruginous Pygmy-owl and its critical habitat.

1.0 Recitals

This Agreement is entered into with regard to the following facts:

- 1.1. The property through which the Improvements will be built contains habitat for the federally listed Cactus Ferruginous Pygmy-owl, (*Glaucidium brasilianum cactorum*).
- 1.2. County intends to improve the Road from Magee Road to approximately one quarter of a mile north of Cortaro Farms Road found in Sections 29, 30 and 31 of Township 12 South, Range 13 East, Pima County, AZ (the “Improvements”).
- 1.3. The Improvements affects on the Cactus Ferruginous Pygmy-owl and its habitat can be found in the Draft Biological Opinion prepared by the Service for County in regard to the Improvements.
- 1.4. County prepared and submitted to Service a Biological Assessment (BA) of the impacts of the Improvements on the identified endangered species for a Section 7 consultation under the Endangered Species Act (ESA). As part of this BA, it was determined that approximately 8.9 acres of suitable habitat for the Cactus Ferruginous Pygmy-owl will be lost due to the Improvements.
- 1.5. Service recommends that development within specific areas be limited to 20 percent. To achieve this ratio, County will offset the loss of the 8.9 acres of suitable habitat within the project area by acquiring and preserving in perpetuity approximately 35.6 acres of suitable Cactus Ferruginous

Pygmy-owl habitat (hereinafter the "Property") within the area (hereinafter the "Habitat Area") depicted in Exhibit 1 of this Agreement.

1.6. The Habitat Area depicted in Exhibit 1 has been identified by the Service as suitable habitat for acquisition by County for the Cactus Ferruginous Pygmy-owl. Acquisition of the 35.6 acres mitigates the effects of the Improvements on the Cactus Ferruginous Pygmy-owl, as described in the Draft Biological Opinion (BO). Failure to acquire the Property will result in re-initiation of consultation under Section 7 of the Endangered Species Act.

1.7. Not all land parcels identified in Exhibit 1 are required to meet the required acreage of 35.6 acres for mitigation of the Improvements. If during a condemnation action by County other appropriate mitigation lands to satisfy this Agreement become available, County has the option to acquire said lands by purchase, gift, condemnation or any other means instead of completing condemnations being pursued for the purposes of this Agreement.

2.0 DEFINITIONS

2.1. Agreement: This Memorandum of Agreement Between United States Fish and Wildlife Service and Pima County, Arizona for the acquisition of mitigation lands for the Thornydale Road Improvements.

2.2. Biological Assessment (BA): As it is used in this MOA, the term Biological Assessment (BA) refers to the BA entitled, "Revised Biological Assessment of Potential Impacts to Cactus Ferruginous Pygmy-Owl From The Thornydale Road Project (Magee Road to 800 Feet North of Cortaro Farms Road), Pima County, Arizona," prepared by SWCA, Inc. for County on May 11, 2001.

2.3. Draft Biological Opinion (BO): As it is used in this MOA, the term Draft Biological Opinion (BO) refers to the Draft BO entitled, "Draft Biological Opinion," submitted by the Service to the Environmental Protection Agency (EPA) on December 6, 2001.

2.4. County: Pima County, Arizona.

2.5. Habitat Area. The area of land depicted in Exhibit 1 of this Agreement.

2.6. Property. 35.6 acres of suitable habitat for the Cactus Ferruginous Pygmy-owl within the Habitat Area.

2.7. Improvements/Road: Thornydale Road from Magee Road to approximately one quarter of a mile north of Cortaro Farms Road found in Sections 29, 30 and 31 of Township 12 South, Range 13 East, Pima County, AZ.

2.8. Service. United States Fish and Wildlife Service.

3.0 COOPERATIVE EFFORT

Service and County agree to continue to cooperate throughout the condemnation proceeding and until County has acquired the required 35.6 acres of mitigation habitat referenced in this Agreement. This Agreement expresses the intent of the parties and shall not be construed to create any remedy other than that available under existing law.

4.0 TERMS USED

Terms defined and utilized in the Biological Assessment (BA), Draft Biological Opinion (BO) and Final Biological Opinion and the ESA have the same meaning when utilized in this Agreement, except as specifically noted.

5.0 AGREEMENT

NOW, THEREFORE, County and the Service pursuant to the above do hereby mutually agree as follows:

COUNTY OBLIGATIONS

5.1. County will acquire by gift, purchase, immediate condemnation action or other means 35.6 acres of suitable Cactus Ferruginous Pygmy-owl habitat.

5.1.a. County agrees to pursue the condemnation action referenced in paragraph 5.1 above in good faith and with no undue delay.

5.1.b. County agrees to not exit, discontinue, or withdraw from the condemnation action except in the case that County agrees to immediately acquire by gift, purchase, or condemnation, 35.6 acres of suitable mitigation habitat in lieu of the condemnation action. The Service must agree to the suitability of the mitigation habitat to be acquired by County under these circumstances.

5.1.c. If the County's condemnation action is unsuccessful, County will immediately contact the U.S. Fish and Wildlife Service of such failure.

5.2. The property, acquired through either condemnation or purchase, will be used to mitigate the impacts of development and operation of the Road.

5.3. County will acquire a minimum of 35.6 acres from the identified parcels in Exhibit 1 attached to this Agreement, or other parcels approved by Service by December 31, 2003, as suitable mitigation habitat. If for any reason County does not acquire through condemnation the Property specified in the Habitat Area in Exhibit 1, County will otherwise diligently pursue the completion of the

acquisition of the specific parcels listed in Exhibit 1 or consult with Service on other appropriate parcels to purchase for mitigation.

5.4. County has prepared a Management Plan for the properties and will implement it as soon as property is acquired. The Management Plan will serve as guidance for the management and conservation of properties acquired to mitigate the effects of the Road. A copy of the management plan is attached as Exhibit 2.

5.5. If condemnation action is required to acquire the Property by County, County shall submit bi-annual reports to Service summarizing the status and progress of the condemnation action to the date of each report.

5.6. County shall, upon successful acquisition of the Property, execute a conservation easement against the Property in favor of the Pima County Flood Control District or another entity agreed upon by the Service for the purpose of establishing the maintenance and conservation of the Property in perpetuity.

SERVICE OBLIGATIONS

5.7. The Service will complete the Final Biological Opinion for the Section 7 consultation associated with the Improvements within the time lines established in the U.S. Code of Federal Regulations.

5.8. In the event the Service fails to issue a completed Final Biological Opinion for the Section 7 consultation associated with the Improvements, this Agreement will be considered null and void.

6.0 AMENDMENTS

This Agreement may be amended consistent with the ESA and with the written consent of each of the parties hereto. Service agrees to process requests for amendments in a timely manner. This Agreement will only be amended upon the written agreement of both parties.

7.0 MISCELLANEOUS PROVISIONS

7.1. No Partnership

This Agreement shall not make or be deemed to make any party to this Agreement the agent for, or the partner of, any other party.

7.2. Successors and Assigns

This Agreement and each of its covenants and conditions shall be binding on and shall inure to the benefit of the Parties hereto and their respective successors and assigns in conformance with the provisions of 50 CFR 13.25 (1994, as amended).

7.3. Notice

Any notice permitted or required by this Agreement shall be delivered personally to the persons set forth below or shall be deemed given five (5) days after deposit in the United States mail, certified and postage prepaid, return receipt requested, and addressed as follows or at such other address as any Party may from time to time specify to the other Parties in writing.

To Service:
Field Supervisor
United States Fish and Wildlife Service
Arizona Ecological Services Office
2321 W. Royal Palm Road, Suite 103
Phoenix, Arizona 85021

To County:
Deputy County Administrator, Public Works
Pima County Dept. of Public Works
100 N. Stone, Suite 300
Tucson, AZ 85701
Tel. 520-205-8350, fax 520-205-8360

with a copy to:
Assistant Field Supervisor
United States Fish and Wildlife Service
Tucson Field Office
110 S. Church Street, Box 52
Tucson, AZ 85701

Copy to:
Director, Pima County Natural Resources,
Parks and Recreation Department
3500 W. River Road
Tucson, AZ 85741
Tel. 520-877-6000, fax 520-877-6006

7.4 Entire Agreement

This fully executed document, including all attached exhibits and documents incorporated by reference, constitutes the entire Agreement between the Parties. Except for the BA and BO, this Agreement supersedes any and all other Agreements, either oral or in writing among the Parties with respect to the subject matter hereof and contains all of the covenants and Agreements among them with respect to said matters. Each party acknowledges that no representation, inducement, promise or Agreement, oral or otherwise, has been made by any other Party or anyone acting on behalf of any other Party that is not embodied herein.

7.5 Elected Officials Not to Benefit

No member of or delegate to Congress shall be entitled to any share or part of this Agreement, or to any benefit that may arise from it.

7.6 Availability of Funds

Implementation of this Agreement by the Service is subject to the requirements of the Anti-Deficiency Act and the availability of appropriated funds. Nothing in this Agreement will be construed by the parties to require the obligation, appropriation, or expenditure of any money from the U.S. Treasury. The parties acknowledge that the Service will not be required under this Agreement to expend any Federal agency's appropriated funds unless and until an authorized official of that agency affirmatively acts to commit to such expenditures as evidenced in writing.

7.7 Multiple Originals

This Agreement may be executed in any number of multiple originals. A complete original of this Agreement shall be maintained in the records of each of the Parties hereto.

7.8 Third-Party Beneficiaries

Without limiting the applicability of the rights granted to the public pursuant to the provisions of 16 U.S.C. §1540(g), this Agreement shall not create any right or interest in the public, or any member thereof, as a third party beneficiary hereof, nor shall it authorize anyone not a Party to this Agreement to maintain a suit for personal injuries or property damages pursuant to the provisions of this Agreement. The duties, obligations, and responsibilities of the Parties to this Agreement with respect to third parties shall remain as imposed under existing Federal or State law.

7.9 Relationship to the ESA and Other Authorities

The terms of this Agreement shall be governed by and construed in accordance with the ESA and other applicable laws. In particular, nothing in this Agreement is intended to limit the authority of the Service to seek penalties in federal court or otherwise fulfill its responsibilities under the ESA. Moreover, nothing in this Agreement is intended to limit or diminish the legal obligations and responsibilities of the Service as an agency of the Federal government.

7.10 References to Regulations

Any reference in this Agreement to any regulation or rules of the Service, shall be deemed to be a reference to such a regulation or rule in existence at the time an action is taken.

7.11 Applicable Laws

The Parties shall comply with all applicable federal, state and local laws, rules, regulations, standards and executive orders, without limitation to those designated within this Agreement.

7.11.1. Anti-Discrimination. The provisions of Arizona Revised Statutes (A.R.S.) Section 41-163 and Executive Order Number 99-4 issued by the Governor of the State of Arizona are incorporated by reference as part of this Agreement.

7.11.2. Americans with Disabilities Act. This Agreement is subject to all applicable provisions of the Americans with Disabilities Act (Public Law 101-336, 42 U.S.C. 12101-12213) and all applicable federal regulations under the Act, including 28 C.F.R. Parts 35 and 36.

7.11.3. Federal Jurisdiction. The Service reserves the right to seek injunctive relief in Federal court for any breach of the terms of this Agreement by County.

7.11.4. A.R.S. § 38-511. This Agreement is subject to cancellation for conflicts of interest pursuant to A.R.S. § 38-511.

7.12 Dispute Resolution

The Parties will cooperate in good faith to achieve the objectives of this Agreement and to avoid disputes. The parties will exert their best efforts to resolve disputes at the lowest organizational level before elevating the dispute to the appropriate officials within their respective organizations.

7.13 Indemnification

To the fullest extent permitted by law, the Parties shall indemnify, defend and hold the other Party, its governing board or body, officers, departments, employees and agents harmless from and against any and all suits, actions, legal or administrative proceedings, claims, demands, liens, losses, fines or penalties, damages, liability, interest, attorney's, consultant's and accountant's fees or costs and expenses of whatsoever kind and nature, resulting from or arising out of any act or omission of the indemnifying party, its agents, employees or anyone acting under its direction or control, whether intentional, negligent, grossly negligent, or amounting to a breach of contract, in connection with or incident to the performance of this Agreement.

7.14 Waiver

Waiver by any Party of any breach of any term, covenant or condition herein contained shall not be deemed a waiver of any other term, covenant or condition or any subsequent breach of the same or any other term, covenant, or condition herein contained.

7.15 Force Majeure

A Party shall not be in default under this Agreement if it does not fulfill any of its obligations under this Agreement because it is prevented or delayed in doing so by reason of uncontrollable forces. The term "uncontrollable forces" shall mean, for the purpose of this Agreement, any cause beyond the control of the party affected, including but not limited to failure of facilities, breakage or accident to machinery or transmission facilities, weather conditions, flood, earthquake, lightening, fire, epidemic, war, riot, civil disturbance, sabotage, strike, lockout, labor dispute, boycott, material or energy

shortage, casualty loss, acts of God, or action or non-action by governmental bodies, other than action or non-action by governmental bodies which are a Party to this Agreement, in approving or failing to act upon applications for approvals or permits which are not due to the negligence or willful action of the Parties, order of any government officer or court, excluding orders promulgated by the Parties themselves, and declared local, state or national emergency, which, by exercise of due diligence and foresight, such Party could not reasonably have been expected to avoid. Any Party rendered unable to fulfill any obligations by reason of uncontrollable forces shall exercise due diligence to remove such inability with all reasonable dispatch.

7.16 Term of Agreement

This Agreement shall be effective upon the date of signature of the last signing party and shall terminate upon recordation of a conservation easement against the Property by County and issuance by Service of the completed Biological Opinion for the Section 7 consultation associated with the Improvements.

IN WITNESS WHEREOF, THE PARTIES HERETO have executed this Implementing Agreement to be in effect as of the date last signed below.

UNITED STATES FISH AND WILDLIFE SERVICE:

By: _____ Date: _____
U.S. Fish and Wildlife Service
Field Supervisor
Phoenix, AZ

PIMA COUNTY ARIZONA:

By: _____ Date: _____
Chairman, Board of Supervisors

ATTEST:

Approved as to form:

By: _____
Clerk of the Board

Deputy County Attorney

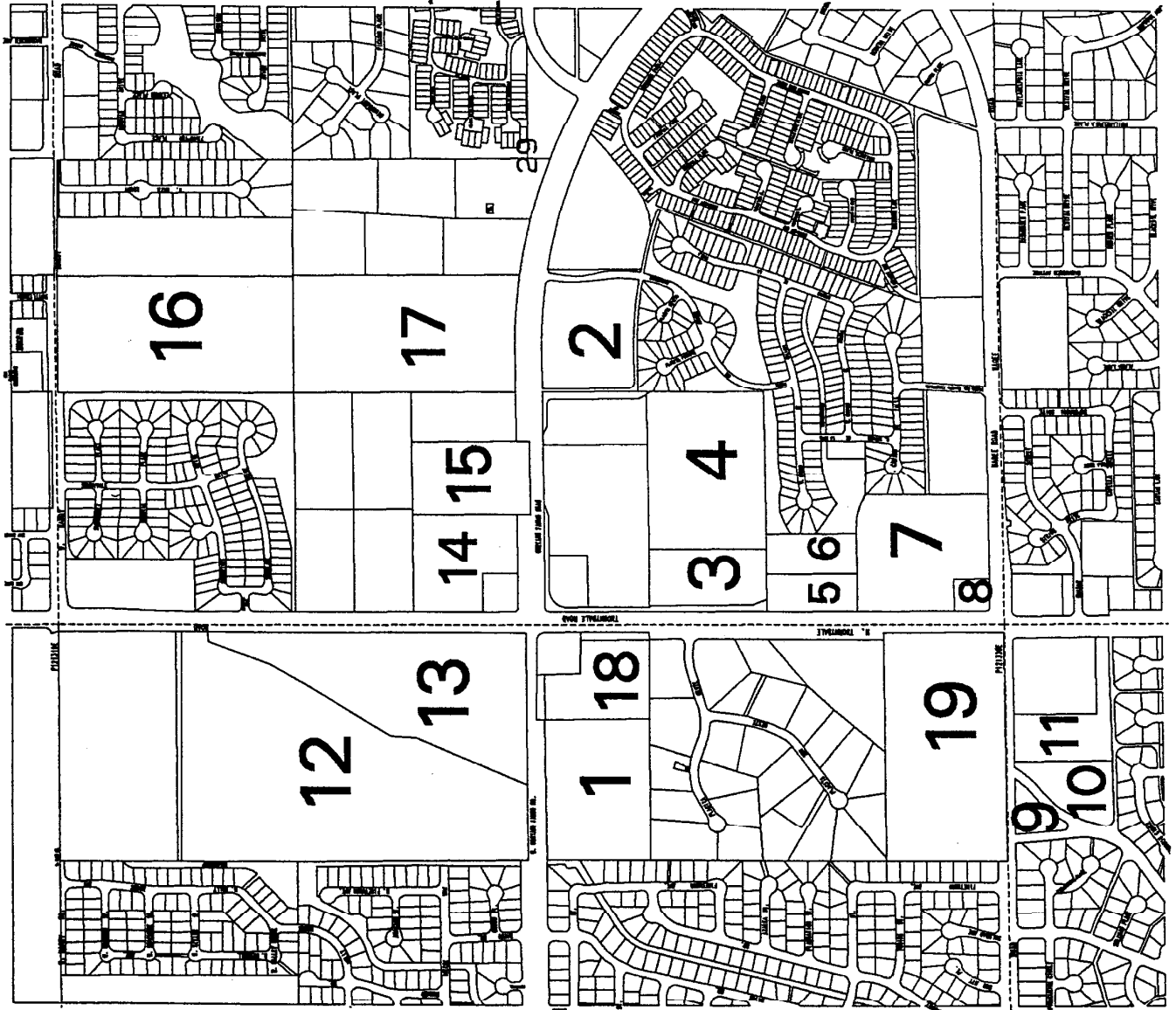
Approved as to content:

By: _____
Deputy County Administrator for Public Works

Exhibits:

- 1: Habitat Area
- 2: Mitigation Lands Management Plan

Habitat Area



T12S

PARCEL	ACRES	OWNER
1. 25232451A	59.8	SOFTWOOD INTERNATIONAL
2. 25232451B	4.9	PLUMMER BELL ASSOCIATES LLP
3. 25232451C	2.0	PLUMMER BELL ASSOCIATES LLP
4. 25232451D	2.0	PLUMMER BELL ASSOCIATES LLP
5. 25232451E	2.0	PLUMMER BELL ASSOCIATES LLP
6. 25232451F	2.0	PLUMMER BELL ASSOCIATES LLP
7. 25232451G	2.0	PLUMMER BELL ASSOCIATES LLP
8. 25232451H	2.0	PLUMMER BELL ASSOCIATES LLP
9. 25232451I	2.0	PLUMMER BELL ASSOCIATES LLP
10. 25232451J	2.0	PLUMMER BELL ASSOCIATES LLP
11. 25232451K	2.0	PLUMMER BELL ASSOCIATES LLP

PARCEL	ACRES	OWNER
12. 25232452A	37.0	PACIFIC INTERNATIONAL
13. 25232452B	18.0	CHRYSLER
14. 25232452C	18.0	CHRYSLER
15. 25232452D	18.0	CHRYSLER
16. 25232452E	18.0	CHRYSLER
17. 25232452F	18.0	CHRYSLER
18. 25232452G	18.0	CHRYSLER
19. 25232452H	18.0	CHRYSLER

EXHIBIT 1

Note: Not shown are 24 additional parcels located adjacent to the Habitat Area.



Scale: 1" = 2,000'

North Arrow



PLANNING AND TECHNICAL SERVICES

1414 West Main Street, 1st Floor
 Boise, Idaho 83720
 Phone: 208-333-3300
 Fax: 208-333-3300
 http://www.dti.co.plm.us

Appendix B

HABITAT MANAGEMENT PLAN
Transportation Corridor CFPO Conservation Land Reserve

INTRODUCTION

CFPO Conservation Land Reserve

Pima County (County) will obtain, manage, and preserve for the conservation of the cactus ferruginous pygmy-owl (CFPO) the below identified Conservation Land Reserve (Reserve) to off-set and minimize the loss of suitable habitat resulting from the improvement of transportation corridors for motor vehicles. The CFPO is listed by the U.S. Fish and Wildlife Service (USFWS) as an endangered species. Loss, fragmentation, and alteration of habitat from residential and commercial developments and some capitol improvements are the primary threats to the CFPO. Establishment of the Reserve is intended to protect existing CFPO habitat and to provide movement corridors for the CFPO. Through proper management of the Reserve, Pima County seeks to preserve native plant populations. Special efforts may be targeted where needed to maintain, protect and restore natural habitat values and ecosystem integrity.

The Reserve may be added to and may also serve as a mitigation bank to provide compensatory mitigation in advance of authorized impacts to similar resources elsewhere.

Site Description

The initial location of the Reserve are properties approved by the USFWS that will minimize and partially off-set adverse impacts to a known CFPO from the construction of Thornydale Road from Magee Road to approximately 1,400 feet north of Cortaro Farms Road. Approximately 14.7 acres have already been acquired for the Reserve. Approximately 36 acres have been identified for acquisition from parcels identified on the attached map.

MANAGEMENT PLAN

Access Restrictions

The Reserve will be fenced using materials that will permit the movement of wildlife and signed to restrict unauthorized access to the property. No actions will be taken to discourage wildlife from using the area. Vehicular access gates will be locked and signed to discourage unauthorized entry.

The fence line around the perimeter of the Reserve will be checked quarterly. Repairs will be performed as needed to maintain the fence. Researchers studying CFPO will be granted access to the property with prior approval from the County and USFWS.

Prohibited Activities

The following activities are prohibited on the Reserve: (1) use of firearms; (2) off road motorized vehicles; (3) use of pesticides or herbicides other than for controlling invasive exotic species; (4) events with crowds of more than 10 people; (5) the construction or vehicular use of roads; (6) land or vegetation clearing of any type except where authorized by the County and the USFWS; and (7) any unauthorized use as outlined in the Conservation Easement.

Survey Information

The Reserve will be surveyed by a qualified biologist or plant ecologist to document the quality of the habitat at the initiation of the Reserve. At least once every three years the Reserve will be surveyed to evaluate habitat quality. Results shall be submitted to the USFWS with the annual monitoring report.

Every two years a survey will be conducted for the presence of CPFO in accordance with the survey protocol approved by the Arizona Game and Fish Department and USFWS at that time. Any CFPO detections shall be reported to the USFWS within 24 hours.

Non-native Vegetation

There are currently no widespread infestations of non-native invasive vegetation in the Reserve. By restricting vehicular access and most uses of the property, the chances of introducing non-native plant species are reduced. If non-native species invades the Reserve, management actions may be taken to remove evasive exotic species. The specific actions taken will depend on the type of species, extent, and location with the approval of the USFWS.

Natural Disasters

If a fire in the area threatens the adjacent properties, fire departments shall respond as needed to protect these properties. In the event of natural disasters, the County will not be responsible for re-establishing lost habitat.

Revegetation and Enhancement

The County shall where possible enhance and restore with native vegetation areas that has been degraded or where vegetation has been otherwise removed by past land management practices. These actions will be intended to improve the habitat condition of the Reserve and enhance its condition for the conservation of the CFPO.

Hazardous Materials

The discharge or release of any material or substance deemed “hazardous” or “toxic” under any applicable federal, state, or local environmental laws will not be allowed. All trash illegally dumped on site shall be removed by the County upon discovery.

Monitoring

The County shall inspect the Reserve quarterly to ensure it is being managed in a manner that meets the indented purposes stated in this Management Plan. Permanent photo points shall be established throughout the Reserve to clearly document the baseline condition of the Reserve and its condition in each subsequent year after it is established. A written report shall be submitted to the USFWS annually with all survey and monitoring results.