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AESO/SE
2-21-01-F-037

December 21, 2001

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

Subject: Biological Opinion on the Effects of the Mountain View High School Improvement Project in Pima County, Arizona

Dear Mr. Oda:

This responds to the Environmental Protection Agency (EPA) May 25, 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 Mountain View High School (MVHS) Improvement Project on the endangered cactus ferruginous pygmy-owl (CFPO or owl) (*Glaucidium brasilianum cactorum*) 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. This permit will allow the addition of a new athletic facility and repositioning of the current athletic fields within MVHS, located at the southwest corner of Thornydale and Linda Vista roads in Pima County.

We have assigned log number 2-21-01-F-037 to this consultation. Please refer to that number in future correspondence on this consultation.

BIOLOGICAL OPINION

Consultation History

The Service and Marana Unified School District began informal consultation on the proposed project on October 24, 2000 continuing with a series of telephone discussions and a meeting on June 20, 2001. A draft biological assessment (BA) (Harris Environmental Group, 2000) was submitted to the Service on February 13, 2001. On May 25, 2001, the Environmental Protection

Agency (EPA) requested initiation of formal section 7 consultation with the Service. On July 27, 2001, we notified the EPA that sufficient information was provided, and formal consultation was initiated on the date we received the request (May 25, 2001). On October 16, 2001, we requested, and you granted, an additional 60-day extension to resolve issues related to adverse effects from this project.

This biological opinion is based on information provided in the BA (Harris Environmental Group, 2001), received on June 4, 2001, which is incorporated herein by reference; correspondence between the Service and Marana Unified School District; telephone and personal conversations; correspondence from, and meetings with the School District, EPA, and Arizona Game and Fish Department (AGFD); and other sources of information. References cited in this draft 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 draft opinion. A complete administrative record of this consultation is on file at this office. We have assigned log number 2-21-01-F-037 to this consultation. Please refer to that number in future correspondence on this consultation.

I. DESCRIPTION OF THE PROPOSED ACTION

Proposed action

The proposed action is the issuance and the School District's utilization of a section 402 NPDES general permit under the CWA from the EPA. Issuance of this permit will facilitate the construction of a new athletic facility and the relocation of the current athletic fields. The proposed athletic facility will be constructed on 2.68 acres and the repositioned athletic fields will occur on 5.18 acres along the southern portion of the site in northwestern Tucson, Pima County, Arizona (Plan 1 of BA). The project is located in Township 12S, Range 13E, Section 19. The elevation ranges from 2,420 to 2,440 feet. Seven pygmy-owl territories exist within 1 to 1 ½ miles of the project site. Prior to September 21, 2001, the project was 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. The new athletic facility would be constructed on the site of a currently existing practice field on the northwestern portion of the property. The existing practice field is located adjacent to the Arthur Pack Desert Golf Course. Within this portion of the golf course, small pockets of native vegetation remain. The proposed practice fields would be re-positioned along the southern portion of the site where athletic fields currently exist and within previously disturbed areas. The existing practice fields are located to the north of Arthur Pack Regional Park.

The School District has incorporated a number of conservation measures to minimize impacts and enhance movement corridors (see 3.0 Conservation Measures in BA), thereby improving connectivity of the existing CFPO territories to adjacent habitats. They are summarized below:

- Degraded areas along the channelized wash, athletic fields and roadways within MVHS will be enhanced by re-vegetation.
- Larger native tree species (trees will be a minimum of 24-inch boxed nursery stock) will be planted in combination with a shrub layer to develop structural diversity along the wash edge and adjacent degraded areas. (Plan II, Landscape Plans)
- Trees also will be planted along the southern boundary of the proposed athletic fields and on the west side of the proposed athletic facility to supplement existing trees and shrubs to facilitate movement of pygmy-owls. (Plan II, Landscape Plans).
- Irrigation of the revegetated areas will be included to guarantee establishment and promote growth. Trees that do not survive within a 3-year time period will be replaced with similar species.
- Because of the close proximity of several known owl territories, AGFD has monitored the area surrounding this site for owl activity. AGFD will continue this monitoring as long as funds are available. In the event AGFD does not continue monitoring, the school district will stay current with surveys to determine owl use within the area prior to construction. Surveys will be done according to approved USFWS 2000 survey protocol.

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.

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 distribution¹:

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).

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

¹ 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, potentially affecting the known distribution and numbers of owls in any particular area.

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 sites² 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 sites³. 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.
- **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

² CFPO sites are nests and resident male CFPO sites that have been confirmed by AGFD or the Service.

³ There was one additional female found in Altar Valley dead in a saguaro cavity, suspected to have been killed by a screech owl (S. Richardson, Arizona Game and Fish Department unpubl. data).

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).

In Texas, one of the few areas 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). 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.

CFPO sites within the vicinity of this project site include: three currently active CFPO nests within approximately 1.5 miles; a long time nest site that was last active in 1999 approximately one mile away; two other nests within approximately 1.5 miles, last active in 1998 and 2000; and two other sites approximately 1.5 miles away last active in 1996 and 1997. Juveniles are annually documented using dispersal corridors around the project site to the north, west and immediately to the south in Arthur Pack Regional Park (S. Richardson, Arizona Game and Fish Department unpubl data).

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 Service has

determined the action area to include the project site⁴ 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 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 maintaining 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.

⁴ The Service defines the project site as the area within the Mountain View High School boundaries.

Over the past 12-month period, we have conducted over approximately 100 informal section 7 consultations within the action area (e.g., capital improvements, 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 projects⁵ 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

⁵ Section 402 and/or 404 permits under the CWA issued by the EPA and COE, respectively.

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 3 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 1.5 miles to the northeast. In July 2001, we completed a consultation on the 7-acre Crescent Ridge Apartments, approximately 1/4 mile to the north of the project site. We have also completed consultations on 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 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 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 and 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.

North of Magee Road along Thornydale Road and north to the project 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 Linda Vista and Thornydale roads consists of a commercial shopping mall on the northwest corner with a gas station and fast food restaurant, and undeveloped (SR) zoned sites on the northeast and southeast corners. There are blocks of undeveloped land containing suitable CFPO habitat to the south of the project site in the 500-acre Arthur Pack Park, and to the west and north on undeveloped (SR) zoned properties.

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 2 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). Most recently in early September 2001, AGFD monitored a CFPO juvenile female dispersing from a nearby nest site using radio telemetry as it dispersed from its natal area, and moved through the Arthur Pack Regional Park directly adjacent to the project site. AGFD and the Service will continue to monitor the location, use area, and breeding status of 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, 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 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 Recovery Team as Special Management Areas (SMAs). The project site 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 sites⁶ 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

⁶ 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.

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).

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 1 ½ miles 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 relative large proportion (67%) of sites where nesting had occurred in the past that 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 Recovery Team has preliminarily recommended Recovery Areas that they believe are necessary for the survival and recovery of the CFPO in Arizona. The project site is within the recommended Recovery Areas. The Team also has initially recommended specific areas within Recovery Areas as Special Management Areas (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. Therefore, based on the best available information, it is recommended that 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 area is within the Northwest Tucson SMA, and it contains suitable habitat providing foraging, sheltering, movement, and dispersal habitat for the CFPO. Because of the amount of human activity and habitat disturbance, nesting is not expected to occur within the actual footprint of this project. However, maintaining vegetative connectivity through the site is important.

IV. EFFECTS OF THE ACTION

This proposed action will develop approximately 7.86 acres of already disturbed areas within the MVHS property. No nesting habitat will be removed.

The School District County will revegetate already disturbed areas with a substantial number of trees, thereby reducing adverse effects from the project substantially. As a result, some habitat values (i.e., foraging and sheltering) may redevelop as vegetation matures. The School District will plant additional trees within the drainage way between the repositioned athletic fields on the southern portion of the property to facilitate movement of owls between the suitable habitat to the south, north and east of the property. (Plan II 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 the fields, and, thereby minimizing adverse effects to the CFPO. In addition, vegetation will be enhanced along the western and northern edge of the property along Linda Vista Road in areas that are currently void of vegetation. This will increase cover and provide additional screening from the human activities at the school. The School District will drip irrigate all plants in revegetated areas to ensure their establishment, provide maintenance and pruning to maintain their health and vigor, and monitor them on a regular basis. This revegetation program will provide some habitat functions (other than nesting habitat) in the future.

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. The County will utilize to the maximum extent possible large boxed specimen trees to provide the greatest amount of cover and screening possible. Smaller 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.

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 School District will comply with all EPA regulations in the use of herbicides, insecticides (pesticides), and fertilizers within the project site, therefore, these adverse effects will be minimized.

The effects that non-directional and high intensity lighting have 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 School District will limit the use of high-intensity lights for organized events at the school. No new lighting is proposed for the ball field under the current phase of construction. Lights may be installed later and will typically only be used during games and practice activities. If installed, the lights will conform to applicable local regulations.

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.

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 habitat particularly important for the expansion of the population.

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 enhance, the existing movement corridors. Movement corridors for the CFPO located to the north, south, west and east of the project site will remain and potentially be improved from the present condition. This will allow continued interchange of owls between sites to other areas to the north within northwestern Tucson. If breeding occurs on adjacent areas, juvenile owls are expected to be able to move from their natal area elsewhere to join other owls and establish territories. An increase in 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 consist of approximately 7.86 acres, on previously disturbed areas. No suitable owl habitat will be removed. Nesting is not currently occurring, nor is it expected in the future within the project site because of the amount of disturbance existing at the site and its close proximity to high human use areas. However, the site is important for dispersal. The enhancement of vegetation throughout the project will benefit the owl by facilitating this dispersal. We believe this approach to be consistent with the best available science and the intent of preliminary recommendations made by 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 draft biological opinion. Future

Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the 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 nexus⁷ (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 five 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 have 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 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 in 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

⁷ Such as a section 402 or 404 permit under the CWA, or some other Federal authorization or funding.

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 action, 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. No suitable nesting habitat exists on the project site.
2. Construction of the athletic facility and the repositioning of the athletic fields will occur in previously disturbed areas.
3. CFPO habitat connectivity within the project site to adjacent suitable habitat areas will be enhanced by planting additional vegetation.
4. The additional vegetation will be maintained through an irrigation system to facilitate growth and survivability.
5. Survivability of planted vegetation will be guaranteed for a 3-year period with replacement of non-viable trees with similar species.

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 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 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 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 Mountain View High School 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 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 draft 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 draft 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.

We have assigned log number 2-21-01-F-037 to this consultation. Please refer to that number in future correspondence on this consultation. Any questions or comments should be directed to Kim Hartwig (520) 670-4637 or Sherry Barrett at (520) 670-4617.

Sincerely,

/s/ David L. Harlow
Field Supervisor

cc: Marana Unified School District (Attn: Scott Mundell)

Assistant Regional Director, Fish and Wildlife Service, Albuquerque, NM (ARD-ES)
C.H. Huckelberry, Pima County Administrator, Tucson, AZ
Arizona Game and Fish Department, Region 5, Tucson, AZ (Attn: Scott Richardson)
Harris Environmental Group, (Attn: Susy Morales)
Director, Arizona Game and Fish Department, Phoenix, AZ

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