



EcoPlan Associates, Inc.
Environmental Science & Resource Economics

Transmittal

Date: April 12, 2010
To: Justin White, ADOT Environmental Planning Group
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From: Thomas C. Ashbeck, EcoPlan Associates, Inc.
Federal Number: STP-A89-B(BCS)A
ADOT Number: 089A CN 385 H7418 01C
EcoPlan Number: 07-071060
Project Name: Oak Creek Canyon Bank Protection
Regarding: Biological Evaluation–Second Submittal

Comments: Attached is the second submittal of the Biological Evaluation (BE) for the referenced project, which is federally funded. The bid advertisement and bid-ready dates are in summer 2010. Construction is expected to last approximately 60 days and is anticipated to occur in fall 2010.

The ADOT project manager is George Wallace, the ADOT National Environmental Policy Act (NEPA) planner is Kevin Grove, the consultant NEPA planner is Greg Martinsen, and the consultant biologist is Thomas C. Ashbeck. Adjacent lands are under the jurisdiction of the Forest Service.

This BE was revised to reflect review comments received via phone from your office on April 1, 2010.

EcoPlan has determined that the project may affect the Mexican spotted owl but is not likely to adversely affect the Mexican spotted owl. EcoPlan also determined that ten Forest Service sensitive species may be impacted by the project but that these impacts will not lead to a trend toward federal listing or loss of viability of these species.

Please contact me at tashbeck@ecoplanaz.com or (480) 733-6666, extension 124, if you have any questions.

Thank you for your time and consideration.



Arizona Department of Transportation

Environmental Planning Group

Biological Evaluation

Oak Creek Canyon Bank Protection

**STP-A89-B(BCS)A
089A CN 385 H7418 01C**

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**April 12, 2010
Second Submittal**

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Add Narrow-headed Gartersnake



All 3 letter
acronyms for
Coconino National
Forest should be
changed to (COF)

1. PROJECT LOCATION

This project is located along State Route (SR) 89A at milepost (MP) 385.1 within Oak Creek Canyon, approximately 10 miles north of the town of Sedona in Coconino County, Arizona (Figures 1 and 2). The project area lies within Section 34 of Township 19 North, Range 6 East on the Munds Park (1974), Arizona, US Geological Survey 7.5-minute topographic series map. Adjacent lands are under the jurisdiction of the Coconino National Forest (CNF).

Throughout this Biological Evaluation (BE), the term “project limits” is used to represent the construction footprint (area of disturbance), while the term “project area” includes surrounding land outside but adjacent to the project limits. The term “project vicinity” is used to denote a more expansive landscape context.

2. PROJECT DESCRIPTION

The Arizona Department of Transportation (ADOT) is planning a bank protection project between the Oak Creek Canyon flow channel and SR 89A, MP 385.1, which follows the slope of the canyon just east of the creek.

In August 1981, gabion baskets were installed by ADOT along SR 89A east of the Oak Creek embankment slope at MP 385.1, from the approximate midpoint of the slope to the toe of the slope (roughly 30 feet). At the southern end of the project, a large rock cliff, which forms the creek bank and extends to the level of the roadway surface, forces Oak Creek to make an abrupt turn of nearly 90 degrees. Local reports indicate that high-water flows during the winter storms of 2004–2005 overtopped the existing rock-filled wire baskets (gabions). The flooding resulted in eddies that undermined the existing soil and contributed to a significant amount of erosion of the roadway embankment in the vicinity of the rock wall. An existing culvert in the project area conveying runoff from the local offsite watershed east of SR 89A into Oak Creek was damaged but still exists within the eroded area.

The objective of this project is to repair the existing embankment and/or provide new bank protection, and to mitigate the erosion caused by stormwater flows and local overland flows.

The scope of work for this project consists of:

placing and fortifying the existing gabions for the full height of the east embankment slope of Oak Creek Canyon along approximately 150 feet of the creek length. Baskets in good condition will have new baskets fastened to them to fortify them. Baskets in poor condition will be replaced with new baskets.

- Repairing the corrugated metal pipe at the south end of the project.
- Removing the existing concrete spillway and installing a concrete slab with wire mesh reinforcement at the edge of the roadway.

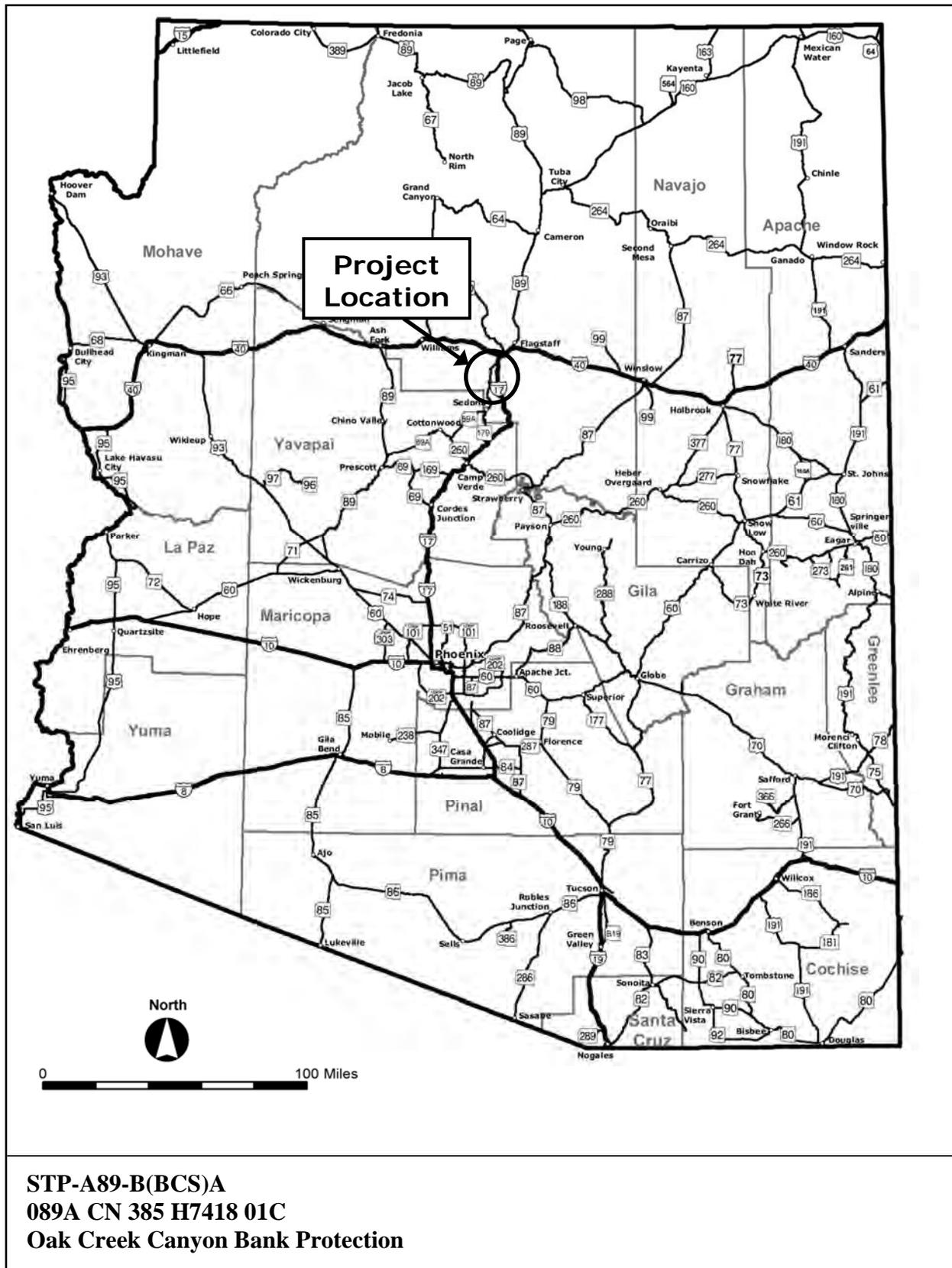


Figure 1. Project location.

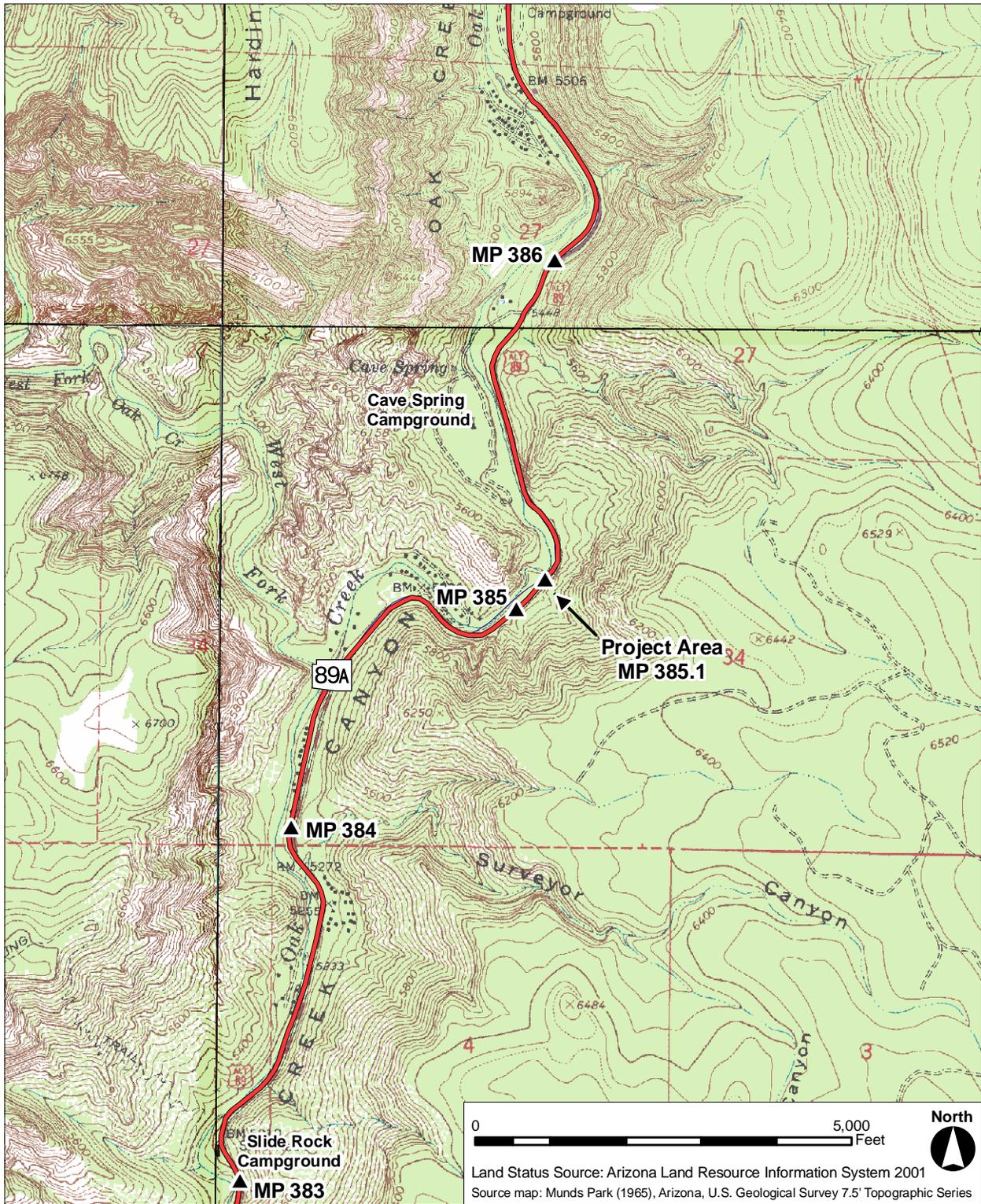


Figure 2. Project vicinity.

V/07-071060/BIO/BE/fig2

During construction, the low-flow channel of Oak Creek (main channel) will be temporarily diverted to the larger high-water channel. A pump will be used to dewater the main channel and to further prevent groundwater from refilling a large pool within the main channel at the south end of the project area, below the rock cliff discussed previously. A crane on SR 89A will be used to lower the pump, **small tractor**, and construction materials into the work area, which is planned to be within the low-flow channel of Oak Creek and on portions of the west bank. ~~Materials used to fill the gabion baskets may be excavated from the west bank.~~ Construction may occur during daytime and nighttime hours and is scheduled to occur this fall (2010) to avoid the height of the summer rains and tourist season. Though the construction period is anticipated to last 60 days, ~~construction could extend into winter or spring of the following year.~~

Though some plants will be disturbed during construction, **no trees greater than 6 inches** in diameter at breast height (dbh) will be removed. Because the project will occur within and immediately adjacent to Oak Creek, a Clean Water Act Section 404 permit and Section 401 certification will be required. The area of temporary and permanent disturbance of the project will exceed 1 acre; therefore, a Section 402 permit will be obtained through the Arizona Department of Environmental Quality (ADEQ), and a Stormwater Pollution Prevention Plan (SWPPP) will be created and implemented. Oak Creek is classified as a unique water; therefore, the ADEQ will review and approve the SWPPP.

3. LOCATION DESCRIPTION

The project area lies between 5,560 feet and 5,600 feet elevation¹ within steep, mountainous canyonland terrain along Oak Creek, a major perennial drainage approximately 10 miles north of the town of Sedona and 25 miles south–southwest of the city of Flagstaff. Oak Creek Canyon, incised deeply into the Mogollon Rim, is more than 800 feet deep in the project area. The eastern side of the canyon ascends quickly to the level of the rim, but terrain is more broken and mountainous to the west. Oak Creek Canyon, encompassing several tributary drainages, has its headwaters on the San Francisco Plateau in the Flagstaff area. The West Fork of Oak Creek, a major perennial tributary, joins the main canyon approximately 0.5 mile downstream of the project limits, and its gorge and inflowing tributaries encompass much of the rough broken terrain west of the project. The generally south-flowing Oak Creek issues from the Mogollon Rim, turns abruptly to the southwest within the red rock country of the Verde Valley, and wanders among sandstone buttes and rolling hills to join the Verde River approximately 30 miles to the southwest.

The Mogollon Rim and the San Francisco Plateau to the north lie at approximately 7,000 to 7,500 feet and consist of generally rolling to gently rolling terrain. The San Francisco Peaks rise to over 12,000 feet near Flagstaff and approximately 35 miles north of the project. The hard volcanic basalt layer of the Mogollon Rim and the San Francisco Plateau includes soils of the Sponseller-Ess-Gordo Association. These are moderately deep and deep, well-drained, medium and moderately fine-textured soils on moderately sloping to steep mountains formed in residuum and colluvium weathered from basalt, rhyolite, andesite, cinders, ash-flow tuff, and related volcanic rocks. The more broken country west of the project include soils of the Soldier-Hogg-McVickers Association—moderately well-drained and well-drained, moderately deep and deep,

¹ Elevations in this document are referenced to mean sea level.

fine-textured, gently sloping to steep mountain soils on the Coconino Plateau and adjacent areas. These soils are formed in residuum weathered from cherty limestone and sandstone—members of the Kaibab and Coconino geologic formations. Where the basalt layer has been breached through the action of flowing water, deep canyons such as Oak Creek Canyon become incised deeply into the softer underlying sandstone layers. In these areas, including the project area, boulders and stones of the harder basalt have survived to line the Oak Creek Canyon streambed and are a major component of the surrounding terrain. Soils in the project area are of the Lithic Haplustolls–Lithic Argiustolls–Rock Outcrop Association. These are dark, shallow, and very shallow, well-drained, gravelly and cobbly, moderately coarse to moderately fine-textured, gently sloping to steep soils and rock outcrops on hills and mountains. These soils are formed in the residuum on igneous and sedimentary hills and mountains (Hendricks 1985, Richard et al. 2000).

Topographic complexity of Oak Creek Canyon in the project area contributes to a complex vegetative community. Vegetation on the slopes above the project area includes interior chaparral (Pase and Brown 1994a) ecotonal with Great Basin conifer woodland (Brown 1994) and Petran montane conifer forest (Pase and Brown 1994b). South- and west-facing aspects are dominated by large patches of scrub live oak (*Quercus turbinella*) and point-leaf manzanita (*Arctostaphylos pungens*). North and easterly-facing aspects are dominated by ponderosa pine (*Pinus ponderosa*) and Douglas-fir (*Pseudotsuga menziesii*). Due to the varying orientation and steepness of slopes in this canyon, the flora within this ecotonal community is diverse. Some common perennial scrubs and trees on the slopes include mountain mahogany (*Cercocarpus betuloides*), snakeweed (*Gutierrezia sarothrae*), alligator bark juniper (*Juniperus deppeana*), one-seed juniper (*Juniperus monosperma*), rocky mountain juniper (*Juniperus scopulorum*), two-needle pinyon (*Pinus edulis*), California buckthorn (*Rhamnus californica*), skunkbush sumac (*Rhus aromatica*), and New Mexico locust (*Robinia neomexicana*). Vegetation along Oak Creek and within sheltered drainages on the slopes include big-tooth maple (*Acer grandidentatum*), boxelder (*Acer negundo*), Arizona alder (*Alnus oblongifolia*), velvet ash (*Fraxinus velutina*), ponderosa pine, Arizona sycamore (*Platanus wrightii*), Douglas-fir, and Gambel oak (*Quercus gambelii*).

The project area lies at the bottom of Oak Creek Canyon and extends onto lower northwesterly-facing terrain. SR 89A in the project area follows the upper edge of the riparian community bordering Oak Creek and the lower edge of the upland community on the canyon slope. The slope above the roadway is ponderosa pine–Douglas-fir–dominated. Some other plants also present within this community are scattered juniper, Gambel oak, and goldenflower century plant (*Agave chrysantha*). The riparian woodland along Oak Creek in the project area is dominated by Arizona alder and boxelder. Some other common species within this riparian community are scattered velvet ash and willow (*Salix* sp.), red raspberry (*Rubus strigosus*), and canyon grape (*Vitis arizonica*). Some plants seen commonly growing immediately adjacent to and within the flowing water of the creek include yellow sweetclover (*Melilotus officinalis*), watercress (*Rorippa nasturtium-aquaticum*), Douglas' water hemlock (*Cicuta douglasii*), and horsetail (*Equisetum* sp.).

The slope between Oak Creek and the SR 89A roadway, where project construction will occur, is a fill slope composed of earth and sandstone rock rubble excavated from the adjacent slope to provide a platform for the roadway. The fill slope is northwesterly oriented and extends to the

streambed below. The lower portion of the slope is covered by existing gabion structures for erosion control. The dominant vegetation on the portion of the fill slope above the gabion structures and below the roadway is slender wheatgrass (*Elymus trachycaulus*). Its abundance suggests that it was intentionally broadcast there to reseed the slope as erosion control. Low shrubs and several small, scattered, volunteer boxelder trees are also present in this disturbed area, as are common mullein (*Verbascum thapsus*), prickly lettuce (*Lactuca serriola*), white sagebrush (*Artemisia ludoviciana*), and squirreltail (*Elymus elymoides*).

4. SPECIES IDENTIFICATION

The US Fish and Wildlife Service (USFWS) list of endangered, threatened, proposed, and candidate species for Coconino County was reviewed by a qualified biologist (Stephen Hale, EcoPlan Associates, Inc. [EcoPlan]) to determine which species may occur in the project area. The following species were identified from this review and are analyzed in detail in this BE.

<u>Common Name</u>	<u>Scientific Name</u>	<u>Status</u>
Mexican spotted owl	<i>Strix occidentalis lucida</i>	USFWS threatened
Northern Mexican gartersnake	<i>Thamnophis eques megalops</i>	USFWS candidate
Roundtail chub	<i>Gila robusta</i>	USFWS candidate



Species included on the USFWS Coconino County list but excluded from further evaluation are addressed in Table 1. This project and the resulting SWPPP will have no effect on the species listed or evaluated in this table.

Table 1. USFWS listed species excluded from further evaluation.

Name	Status	Habitat Requirements	Exclusion Justification
Apache trout <i>Oncorhynchus gilae apache</i>	T	Streams and rivers generally above 6,000 feet elevation with adequate stream flow and shading; temperatures below 77 degrees F; and substrate composed of boulders, rocks, gravel, and some sand and silt. Elevation: >5,000 feet.	The stream in Oak Creek Canyon in the project could potentially provide suitable Apache trout habitat. However, Apache trout are not known from Oak Creek. The nearest known populations lie in the White Mountains, approximately 120 miles southeast of the project area.
Black-footed ferret <i>Mustela nigripes</i>	E	Grassland plains; generally found in association with prairie dog colonies. Elevation: <10,500 feet.	No prairie dog colonies are in the project area. The black-footed ferret was extirpated from the state in the past century. An experimental-nonessential population was reintroduced to Aubrey Valley in western Coconino County, approximately 60 miles northwest of the project area.
Brady Pincushion cactus <i>Pediocactus bradyi</i>	E	Benches and terraces in Navajo Desert near Marble Canyon. Elevation: 3,850 to 4,500 feet.	The project lies approximately 1,000 feet above the elevation range of the species. The project area lies approximately 100 miles south of the known range of the species.

Table 1. USFWS listed species excluded from further evaluation.

Name	Status	Habitat Requirements	Exclusion Justification
California condor <i>Gymnogyps californianus</i>	E	High desert canyons and plateaus. Elevation: Varies.	No suitable habitat. The forested canyon and surrounding forested plateaus do not provide suitable condor habitat. An experimental-nonessential population exists near the Vermillion Cliffs, from which wide-ranging individuals may potentially forage into the project vicinity; however, habitat in the project area and vicinity does not represent preferred habitat, and birds would not remain in the area.
Chiricahua leopard frog <i>Lithobates chiricahuensis</i>	T	Streams, rivers, backwaters, ponds, and stock tanks that are mostly free from introduced fish, crayfish, and bullfrogs. Elevation: 3,300 to 8,900 feet.	The project area does not lie within the current or known historic range of the species. The stream in Oak Creek Canyon appears to represent potentially suitable habitat for the species. However, the nearest historic records for this species lie along the Mogollon Rim and extend onto the Mogollon Plateau, approximately 35 miles southeast of the project area. The nearest extant population lies in the Buckskin Hills, south of SR 260 in eastern Yavapai County, approximately 40 miles south of the project area.
Fickeisen plains cactus <i>Pediocactus peeblesianus</i> var. <i>fickeiseniae</i>	C	Shallow soils derived from exposed layers of Kaibab limestone. Found on canyon margins, well-drained hills in Navajoan Desert, or Great Plains grassland. Elevation: 4,000 to 5,000 feet.	The project lies over 500 feet above the known elevation range of this species. There are no exposed layers of Kaibab limestone on canyon margins, well-drained hills in Navajoan Desert, or Great Plains grassland habitat in the project area. The nearest populations lie near the community of Gray Mountain along US 89, 30 miles north of Flagstaff and nearly 55 miles north of the project area.
Humpback chub <i>Gila cypha</i>	E	Large, warm, turbid rivers, especially canyon areas with deep, fast water. Elevation: <4,000 feet.	No suitable rivers are in the project area. The project area lies more than 1,500 feet above the known elevation range of the species. The nearest population occurs in the Grand Canyon, approximately 75 miles northwest of the project area.
Kanab ambersnail <i>Oxyloma haydeni kanabensis</i>	E	Travertine seeps and springs in Grand Canyon National Park. Elevation: 2,900 feet.	The project area lies more than 2,600 feet above the known elevation range of the species. The nearest population occurs in the Grand Canyon, approximately 75 miles northwest of the project area.
Little Colorado spinedace <i>Lepidomeda vittata</i>	T	Moderate to small streams in pools and riffles, with water flowing over gravel and silt. Elevation: 4,000 to 8,000 feet.	The stream in Oak Creek Canyon may potentially provide suitable habitat for the species; however, the species is not known outside the Little Colorado River drainage. The nearest known population, along Clear Creek, which includes designated critical habitat for the species, lies approximately 50 miles southeast of the project area.
Navajo sedge <i>Carex specuicola</i>	T	Silty soils at shady seeps and springs. Elevation: 5,700 to 6,000 feet.	The project area does not include the preferred soil type for this species. The nearest known population lies in northeastern Coconino County, approximately 140 miles northeast of the project area.

Table 1. USFWS listed species excluded from further evaluation.

Name	Status	Habitat Requirements	Exclusion Justification
Razorback sucker <i>Xyrauchen texanus</i>	E	Riverine and lacustrine areas. Generally not in fast-moving water. May use backwaters. Elevation: <6,000 feet.	No suitable rivers are in the project area. Despite its perennial condition, Oak Creek Canyon is not of sufficient size to provide suitable riverine and lacustrine habitat for razorback suckers. Historically, the species occupied the major rivers in Arizona, but it has since been extirpated from most of its former range in the state. These fish are present along the Colorado River. A population has been reintroduced along the Verde River near and upstream of Horseshoe Dam, approximately 60 miles south of the project location.
San Francisco Peaks ragwort <i>Packera franciscana</i>	T	Alpine tundra habitat. Elevation: 10,900+ feet.	The project area does not include alpine tundra habitat and is approximately 5,300 feet below the elevation range of this species. Known populations of this species lie approximately 35 miles north of the project area on the San Francisco Peaks
Sentry milk vetch <i>Astragalus cremnophylax</i> var. <i>cremnophylax</i>	E	Grows on a white layer of Kaibab limestone, with little or no soil, in unshaded openings within a pinyon-juniper-cliffrose plant community Elevation: >4,000 feet.	The project area does not lie within the vegetation community or include the soils preferred by this species. This species is known only from locations on the rim of the Grand Canyon, approximately 70 miles northwest of the project area.
Siler pincushion cactus <i>Pediocactus sileri</i>	T	Desertscrub transitional areas of Navajo, sagebrush, and Mojave deserts. Elevation: 2,800 to 5,400 feet.	No suitable desertscrub habitat for this species is present in the project area. This species is known only from extreme northern Coconino County, approximately 110 miles northwest of the project area.
Southwestern willow flycatcher <i>Empidonax traillii extimus</i>	E	Cottonwood/willow and tamarisk vegetation communities along rivers and streams. Elevation: <8,500 feet.	The project area does not include cottonwood/willow and tamarisk vegetation communities characteristic of the seasonal habitat of this species. Individuals of this species may migrate along Oak Creek but would not be expected to remain in the area. The species is seasonally present along the Verde River, approximately 30 miles southwest of the project area.
Welsh's milkweed <i>Asclepias welshii</i>	T	Open, stabilized desertscrub dunes and on the lee side of active dunes. Elevation: Varies.	The project area lacks the stabilized desertscrub dune habitat preferred by the species. This species is known only from sand dune areas in northern Arizona and southern Utah, approximately 90 or more miles north of the project area.
Yellow-billed cuckoo <i>Coccyzus americanus</i>	C	Large blocks of riparian woodlands (cottonwoods, willow, or tamarisk galleries). Elevation: <6,500 feet.	The project area does not include large blocks of riparian woodland with cottonwoods, willow, or tamarisk gallery forest habitat characteristic of the seasonal habitat of this species. Individuals of this species may migrate along Oak Creek but would not be expected to remain in the area. The species is seasonally present along the Verde River, approximately 30 miles southwest of the project area.

C = Candidate, E = Endangered, T = Threatened (USFWS 2010).

5. SPECIES EVALUATION

THREATENED SPECIES

Mexican spotted owl (*Strix occidentalis lucida*)

Life History

The Mexican spotted owl (MSO) is a medium-sized owl mottled with irregular white and brown spotting on the body and head. The Mexican subspecies, *S. o. lucida*, is lighter in overall coloration than the West Coast subspecies, *S. o. occidentalis*. Spotted owls are distinguished from most other owls by their dark eyes. The MSO is the most widely distributed of the subspecies. It ranges from the southern Mexican state of Puebla northward through the highlands of the Sierra Madre Occidental and the Madrean Archipelago into Arizona and southern New Mexico. In the United States, the range extends from southern Arizona, north across Arizona's central plateau and into southern Utah, across western and central New Mexico, and into southern Colorado and western Texas (USFWS 1993).

The MSO prefers shaded canyons in forested mountains and high mesas. In the 1870s and earlier, the species occurred in Arizona at lower elevations in cottonwood gallery forests around Tucson; more recently, its occurrence appears to be restricted to higher elevations. Though the range of the MSO is large, its distribution is discontinuous. In Arizona, this owl prefers mixed-conifer forests dominated by Douglas-fir and/or white fir commonly associated with Southwestern white pine, limber pine, and ponderosa pine. In northern Arizona, the MSO prefers steep-walled, rocky canyons. Along the Mogollon Rim, the MSO is less restricted, occupying mixed-conifer forests, ponderosa pine–Gambel oak forests, rocky canyons, and associated riparian forests. The MSO population densities are higher in mixed-conifer forests than in pine-oak, pine, or pinyon-juniper associations. Habitats suitable for MSO nesting or roosting appear to be more restricted than those required for foraging. The species will forage in more open areas, but their preference is for areas undisturbed by logging activity (USFWS 1995).

The MSO usually selects nesting and roosting sites with high canopy closure and a few old-growth trees. Mexican spotted owl nests are most commonly located in caves or on cliff ledges in a steep-walled canyon. Witches' broom and tree stick platforms are occasionally used for nests, though less commonly. Most nests are on moderate to steep slopes with northern or eastern exposures, indicating a preference for cooler portions of the habitat (USFWS 1993).

Due to habitat changes and fragmentation resulting from timber harvesting, other forest management practices, and increased predation, the MSO was listed as threatened (USFWS 1993). Critical habitat was designated for the species (USFWS 2004). According to the USFWS (2004), critical habitat excludes federal lands that do not contain protected and/or restricted habitat as described in the recovery plan. Private and state lands within mapped boundaries are not designated as critical habitat.

The project area lies within the Upper Gila Mountains Recovery Unit. The recovery plan for this species identifies primary constituent elements (i.e., habitat features that support nesting, roosting, and foraging) for forest and canyon habitats, including ponderosa pine, mixed conifer, spruce-fir, Chihuahua pine, quaking aspen, and riparian forest cover types. The recovery plan also identifies several categories of lands or habitats based on their importance in supporting

nesting, roosting, and foraging habitat for the MSO. Protected Activity Centers (PACs) are 600-acre core areas established around nest sites where most management activities are restricted or disallowed (i.e., Protected Areas). Restricted Areas are not protected but have specific management guidelines outlined in the recovery plan. They include mixed conifer, pine-oak, and riparian forest types. Other forest and woodland types, including ponderosa pine and spruce-fir forest, aspen, and pinyon-juniper woodland, are generally not used for nesting or roosting but may be used for foraging, dispersal, and/or wintering habitat (USFWS 1995).

Survey History

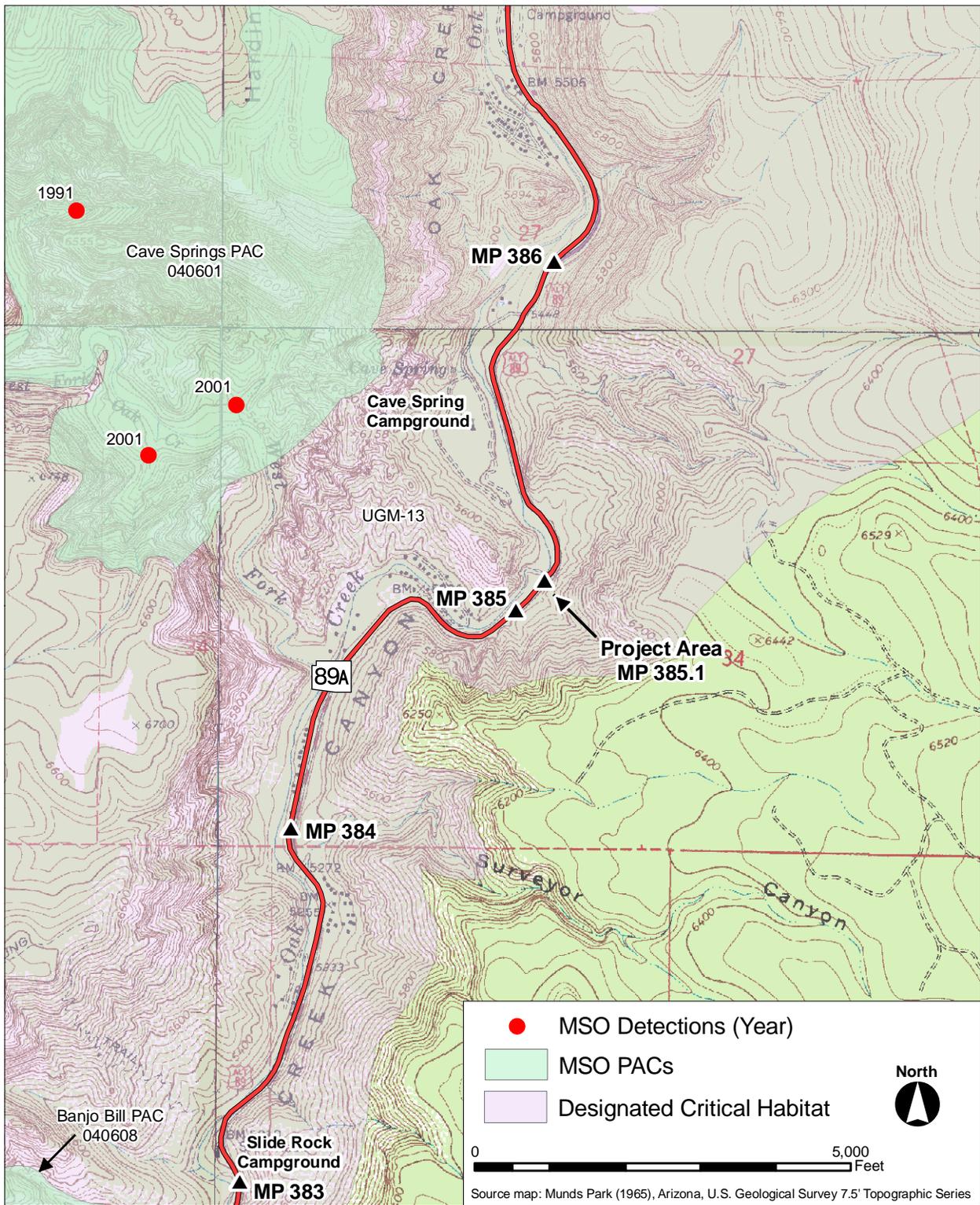
Biologists from the CNF have conducted surveys for the MSO on the forest since the mid-1980s, identifying nesting areas and establishing PACs surrounding known and presumed nesting areas. Monitoring surveys have been conducted each year within many of these PACs, though yearly surveys were discontinued if no responses were detected for several years in succession, with periodic resurveys to determine if owls had returned.

Eight MSO PACs lie within 3 miles of the project area. These lie primarily on the west side of Oak Creek Canyon and along the west fork of Oak Creek to the southwest, west, and northwest, with one PAC along Pumphouse Canyon to the northeast. The three nearest PACs for which survey data would be relevant to the current project include Cave Springs PAC (040601), Banjo Bill PAC (040608), and Sterling Canyon (040215).

The Cave Springs PAC boundary lies approximately 0.75 mile northwest of the project limits (Figure 3). The nearest owl detection occurred approximately 1 mile northwest of the project limits, within the PAC boundary. Much of this PAC lies along the west fork of Oak Creek. The Cave Springs PAC has been under observation since 1990 and was last surveyed in 2003. Though occupancy by a pair was confirmed in 1990 and again in 2002, and at least one bird was detected during three other years, nesting was never confirmed. Figure 3 shows the three MSO detections closest to the project limits within the Cave Springs PAC.

Banjo Bill PAC (Figure 3) lies along the western slope of Oak Creek Canyon approximately 1.25 miles southwest of the project area, and the nearest owl detection occurred approximately 2 miles southwest of the project area. This PAC has been under observation since 1998 and was last surveyed in 2001. Occupancy by a single owl was determined in 1998 and in 2001.

Sterling Canyon PAC (not shown on Figure 3) lies nearly 2 miles northwest of the project area along the western slope of Oak Creek Canyon, extending into Sterling Canyon. The nearest owl detections occurred approximately 2.5 miles northwest in 1992. This PAC has been under observation since 1990 and was last surveyed in 2001. Occupancy by a pair was determined in 1990, 1992–1994, and again in 2000 and 2001, and by a single owl in 1991 and 1995. In 1992 and 1993, nesting resulted in one and two young, respectively, at a nest approximately 2.5 miles northwest of the project area in Sterling Canyon.



**STP-A89-B(BCS)A
089A CN 385 H7418 01C
Oak Creek Canyon Bank Protection**

Figure 3. MSO PACs and designated critical habitat.

V07-071060/BIO/BE/fig3

Habitat Evaluation and Suitability

Much of Oak Creek Canyon, from just north of Sedona through the project area onto the San Francisco Plateau to the north and northeast, lies within designated critical habitat unit UGM-13. The project area does not lie within a designated PAC and, therefore, does not lie within an MSO protected area. However, the project area lies within a canyon and along a riparian community within a mixed-conifer forest type—habitats that are considered restricted areas, as described in the recovery plan (USFWS 1995). The project area lies within MSO critical habitat.

MSOs prefer to nest in more remote portions of the Oak Creek Canyon drainage, but habitat in the project area does represent foraging habitat, and foraging individual MSOs are likely occasionally present in Oak Creek Canyon in the project area.

Analysis and Determination of Effects

The project area lies within steep canyon terrain along a riparian area within a mixed conifer forest—habitat considered a restricted area—and within designated critical habitat Unit UGM-13 of the MSO. Though the project limits do not lie within the boundary of an MSO PAC, the project area represents foraging and dispersal habitat. Project activity will incur some disturbance to the Oak Creek channel but will only result in removal of small-diameter trees (6 inches dbh or less) and other understory plants from a 0.50-acre area. Because no trees greater than 6 inches dbh will be removed during construction, no potential nest or roost trees will be affected. Trees to be removed would not constitute possible nest or roost trees in the foreseeable future.

Proposed work is currently planned to occur in the fall after the MSO breeding season, however, and though unlikely, unforeseen circumstances could cause construction to overlap the MSO breeding season. Construction work occurring during nighttime hours when MSOs are active may interfere with routine MSO foraging and/or dispersal activities. Individual owls would likely avoid the project area as a result of the temporary increase in activity.

Possible effects of construction noise on MSOs are influenced by the timing of construction activities, distance from noise source to receptor, intervening topography, and behavioral responses of birds. Research conducted on birds of prey, including MSOs, indicates that (1) responses of birds vary by species, activity/disturbance type, duration, timing, distance, noise level, and visibility; (2) distance appears to be the best predictor of response frequency; and (3) most species studied appeared to habituate to certain noises with repeated exposure (Andersen et al. 1989, Becker 2002, Ellis and Ellis 1991, Grubb et al. 1998, Grubb and King 1991, Holthuijzen et al. 1990, Platt 1977).

Though some studies have examined the effects of human-caused noise disturbance on MSOs, most species studied have been diurnal raptors. Because human activities occur during daylight hours, when birds are most active, they can affect important behaviors such as foraging and prey delivery (McGarigal et al. 1991). In contrast, MSOs are active nocturnally, during periods when no construction activities would occur. A study of flush responses to hikers by MSOs roosting in narrow canyons in southern Utah detected no flushes by either juvenile or adult birds when hikers were 55 meters (± 180 feet) or more away from roost sites (Swarthout and Steidl 2001). In a study in Colorado, no flush responses by MSOs were recorded to jets flying over roost sites, though aircraft were at least 600 meters away (Johnson and Reynolds 2002). Most relevant, a

study in New Mexico detected no flush responses by nesting MSOs when noise stimuli (helicopter overflights and chainsaws) were more than 105 meters (344 feet) away (Delaney et al. 1999). Based on these findings, a minimum 105-meter buffer around nest sites was recommended to prevent disturbance of nesting MSOs by helicopters or chainsaws. These researchers also documented a mean alert response (i.e., owls turning toward direction of noise, indicating awareness, but not flushing) distance threshold of 403 meters (1,322 feet), which corresponds closely to the 400-meter (1,312 feet) buffer zone recommended by the USFWS around MSO nest sites (Delaney et al. 1999).

Results of these studies on the MSO were similar to some studies conducted on diurnal raptors in that (1) response frequency and intensity to noise stimuli were generally low, except in close proximity to the nest or roost, (2) responses were lower during the incubation and nestling period than at other times, (3) responses to instantaneous/sudden noise stimuli (i.e., chainsaw startup, explosions, sonic booms) were higher than responses to stimuli with a gradual onset (aircraft approaching from a distance), and (4) birds appeared to habituate to repeated noise stimuli over time.

EcoPlan (2006) reported noise levels associated with a pavement milling machine and associated construction activities within MSO designated critical habitat along SR 260 where it ascends onto the Mogollon Rim, approximately 60 miles southeast of the SR 89A project area. Though the noise level at each construction site was relatively loud (70–80 A-weighted decibels [dBA]), it was rapidly attenuated over the 400-meter distance of each monitoring transect (40–50 dBA at 400 meters [1,312 feet; ca. 0.25 mile]). Noise levels in this range are equivalent to that of ambient noise levels at 400 meters from the roadway. The boundary of the nearest MSO PAC, Cave Springs MSO PAC, is approximately 0.75 mile (3,960 feet) from the project limits. The noise level at the PAC boundary would be less than 40–50 dBA.

Effects of noise on nesting MSOs in the project vicinity will be minimized by distance and topography. Proposed work will be at least 0.75 mile from the nearest PAC boundary. Intervening topography (ridges, canyon rims) between the construction area and nest/roost sites will further diminish construction noise. The noise of equipment used for this bank protection project will be attenuated over these distances to levels equivalent to those of normal traffic activity at the same distance. It is anticipated that construction noise generated at the site would contribute to the avoidance of the project area by foraging or dispersing MSOs during nighttime hours.

Project activity will not constitute an adverse effect on designated critical habitat; however, the project may directly affect the MSO should construction occur at night. It is anticipated that the project will not indirectly affect (effects that are certain to occur later in time) the MSO.

Cumulative effects include the effects of future state, local, or private actions that are reasonably certain to occur within the project limits considered in this BE. Future federal actions are subject to the consultation requirements established under section 7 of the Endangered Species Act and, therefore, are not considered cumulative in the proposed action. The project is an isolated, independent action. No increase in activity in the area is expected to occur as a result of the project. No state, local, or private actions are likely to occur as a result of the project; therefore, there are no expected cumulative effects on the MSO.

Determination

The project may affect the Mexican spotted owl but is not likely to adversely affect the Mexican spotted owl. The project will not adversely modify designated critical habitat. 

CANDIDATE SPECIES

Northern Mexican gartersnake (*Thamnophis eques megalops*)

Life History

The northern Mexican gartersnake is a relatively large species, reaching an adult size of more than 3 feet. Its background color is olive to brown, with three longitudinal stripes, the lateral of which occupies the third and fourth scale rows on the neck and upper body. Two rows of indistinct spots occur along the body between the vertebral and lateral stripes. This species is most commonly associated with marshy habitat along permanent and semipermanent streams and ponds, where it forages for frogs, frog larvae, and fish. Young are born alive and number to 25 or more (Stebbins 1954, 2003; Brennan and Holycross 2006). During the summer rainy season, this species is occasionally found dispersing in search of additional habitat. In Arizona, the Mexican garter snake occupies moderate elevations from approximately 2,500 to over 5,000 feet elevation and from riparian habitats in Sonoran desertscrub, semidesert grassland, and Madrean evergreen woodland communities (Rosen and Schwalbe 1988).

Formerly more abundant throughout its range in Arizona, the draining of marshy habitat since the late nineteenth century has reduced available Mexican garter snake habitat in some areas. The more recent introduction of bullfrogs, and to a lesser extent game fish, has severely limited the survival of juvenile snakes at sites where these predatory species have become established (Rosen and Schwalbe 1988).

Survey History

The northern Mexican garter snake was found in 1975 at the lower end of Oak Creek Canyon in the vicinity of Midgley Bridge, about 2.5 miles northeast of Sedona, and approximately 7.5 miles downstream of the project area (Sabra Schwartz, Arizona Game and Fish Department [AGFD] Heritage Data Management System [HDMS] program supervisor, personal communication). More recent 1986 surveys specifically in search of the species in the area of Midgley Bridge failed to detect them (Rosen and Schwalbe 1988). The species also has not been encountered during repeated surveys for the narrow-headed gartersnake (*Thamnophis rufipunctatus*) throughout Oak Creek Canyon through 2008 (Sabra Schwartz, AGFD HDMS, personal communication). However, the species is present in limited numbers in the vicinity of the Page Springs Fish Hatchery, along Oak Creek (Janie Agyagos, wildlife biologist, **CNF**, Red Rock Ranger District, personal communication) approximately 12 miles (15 or more stream miles) southeast of Sedona and approximately 25 miles downstream of the project area.

Habitat Evaluation and Suitability

The perennial stream habitat along Oak Creek Canyon appears potentially suitable for the northern Mexican gartersnake; however, the species has not been reported from within Oak Creek Canyon above Midgley Bridge, approximately 7.5 miles downstream of the project area, and that record is nearly 35 years old. Repeated gartersnake surveys in that area and

throughout most of Oak Creek Canyon through 2008 have not detected the species within the canyon. Though reasons for its absence from areas between the Page Springs Fish Hatchery and Midgley Bridge in recent years may be more complex, the absence of records of the species within narrow, winding Oak Creek Canyon in the project area and for several miles downstream may be as simple as that the species prefers the more gentle, meandering stream habitat within the Verde Valley to the more steep mountain stream habitat within the canyon (Janie Agyagos, CNF, personal communication).

Analysis and Determination of Effects

The northern Mexican gartersnake has not been reported to occur in the project area or for several miles downstream of the project area. Historic localities upstream of the Page Springs Fish Hatchery to within 7.5 miles downstream of the project location are apparently unoccupied. Because this species is likely absent from Oak Creek in the project vicinity, the project will have no direct effect on the northern Mexican gartersnake. Because mitigation measures incorporated into the requirements for Clean Water Act permits and certifications associated with the project will minimize downstream effects on occupied northern Mexican gartersnake habitat, the project will have no indirect effect on the northern Mexican gartersnake.

Determination

The project has no impact on the northern Mexican gartersnake.

Roundtail chub (*Gila robusta*)

Life History

The roundtail chub is a cyprinid (minnow family) fish with a streamlined body shape. The color is usually olive-gray to silvery, with a lighter belly, sometimes with dark blotches on the sides. Adults reach 9 to 14 inches in length but can reach 20 inches (Minckley 1973, USFWS 2009).

Within the lower Colorado River basin, roundtail chubs are found in cool to warm waters of streams and rivers, often occupying the deepest pools and eddies of large streams (Minckley 1973, USFWS 2009). Roundtail chubs are often found around boulders, vegetation, and undercut banks but are less apt to use cover than the headwater chub (*Gila nigra*) and Gila chub (*Gila intermedia*) (Minckley and DeMarais 2000, USFWS 2009).

Roundtail chubs are omnivorous, eating whatever is available, including aquatic and terrestrial invertebrates, aquatic plants, detritus, and fish and other vertebrates; algae and aquatic insects often form a major portion of the diet (Bestgen 1985, Schreiber and Minckley 1981, USFWS 2009).

Based on museum collection records, agency database searches, literature searches, and discussion with biologists, it has been estimated that the historical distribution of the roundtail chub in the lower Colorado River basin included the Gila and Zuni rivers in New Mexico; the Black, Colorado (though likely only as a transient), Little Colorado, Bill Williams, Gila, San Francisco, San Carlos, San Pedro, Salt, Verde, White, and Zuni rivers in Arizona; and numerous tributaries within those basins (Voeltz 2002, USFWS 2009).

Due to the geographic isolation of the lower Colorado River basin portion of the species population from the upper Colorado River basin in states north of Arizona, and other factors, the lower Colorado River basin portion of the species distribution qualifies as a distinct population segment (DPS). The fragmentation of its distribution, extirpation from certain locations, and ongoing threats to other populations has led the USFWS to list the lower Colorado River basin DPS of the roundtail chub as a candidate species (USFWS 2009).

Survey History

The roundtail chub was reported from the area of the old Sedona ranger station, just below Sedona, in 1936. The species has been reported as far upstream as 6 miles north of Sedona in 1950 and again in 1963. The most recent records for the species in the project vicinity are from the area of the SR 179 bridge in Sedona to 1 mile upstream in 2001 (Sabra Schwartz, AGFD HDMS, personal communication), approximately 9 miles downstream of the project area.

Habitat Evaluation and Suitability

Though there are historic records for the roundtail chub from the 1950s and 1960s as far as 6 miles upstream of Sedona to within approximately 4 miles downstream of the project area, the species has not been reported from the project area. More recent accounts indicate that the species does not ascend the stream far above Sedona. It is likely that the roundtail chub prefers the more gentle, meandering stream habitat within the Verde Valley to the more steep mountain stream within the canyon. The lack of records in the project area indicates that the species does not range that far upstream from its preferred habitat.

Analysis and Determination of Effects

Historically, the roundtail chub has been reported to occur in Oak Creek Canyon to within 4 miles downstream of the project area. Recent detections for the species indicate that it prefers the meandering stream habitat of the Verde Valley and does not often range into lower Oak Creek Canyon. As mitigation for impacts to fish in general, ADOT will remove any stranded fish from the pool at the southern end of the project limits and the dewatered stream channel, after flows have been dewatered, via an upstream diversion. Fish captured from this pool will be moved to a downstream location outside the project disturbance limits.

Because roundtail chubs have not been recorded from the reach of Oak Creek, which includes the project limits, and because fish stranded within the project limits will be relocated downstream, prior to construction, the project will have no direct effect on the roundtail chub. Because mitigation measures incorporated into the requirements for Clean Water Act permits and certifications associated with the project will minimize downstream effects to occupied northern roundtail chub habitat 25 miles downstream, the project will have no indirect effect on the roundtail chub.

Cumulative effects include the effects of future state, local, or private actions that are reasonably certain to occur within the project limits considered in this BE. Future federal actions are subject to the consultation requirements established under section 7 of the Endangered Species Act and, therefore, are not considered cumulative in the proposed action. No increase in activity in the area is expected to occur as a result of this project. No other state, local, or private actions are

likely to occur as a result of this project; therefore, there are no expected cumulative effects on the roundtail chub.

Determination

The project has no impact on the roundtail chub.

FOREST SERVICE SENSITIVE SPECIES

The CNF Red Rock Ranger District maintains a list of Forest Service sensitive species that are known or suspected to occur within the district. Janie Agyagos, CNF, provided a list of Forest Service sensitive species potentially occurring in the project area. The AGFD On-line Environmental Review Tool was accessed to determine special status species known to occur within 2 miles of the project. Sabra Schwartz, AGFD HDMS, provided locality records for several Forest Service sensitive species within 2 miles of the project area. Based on information obtained from these sources, eight Forest Service sensitive species not already federally listed are documented to occur within 2 miles of the project. A number of Forest Service sensitive species known to occur in the general area are included because potentially suitable habitat is present. Based on these criteria, Forest Service sensitive species known or suspected to occur in the project area are evaluated in Table 2.

Table 2. Forest Service sensitive species known to occur within 2 miles of the project area or for which suitable habitat or foraging habitat is present in the area.

Common Name	Scientific Name	Occupied Habitat Present?	Suitable Habitat Present?	Suitable Habitat Affected?	Species Potentially Affected?
Mammals					
Allen’s big-eared bat ^a	<i>Idionycteris phyllotis</i>	No	Foraging	No	No
Greater western Western bonneted bat ^b	<i>Eumops perotis californicus</i>	No	Foraging	No	No
Pale Townsend’s big-eared bat ^c	<i>Corynorhinus townsendii pallescens</i>	No	Foraging	No	No
Spotted bat ^d	<i>Euderma maculatum</i>	No	Foraging	No	No
Western red bat ^e	<i>Lasiurus blossevillii</i>	Unknown	Foraging, roosting	Yes	No
Birds					
Abert’s towhee ^f	<i>Pipilo aberti</i>	Yes	Yes	Yes	Yes
American peregrine falcon ^g	<i>Falco peregrinus anatum</i>	Yes	Yes	Yes	Yes
Bald eagle (wintering population)	<i>Haliaeetus leucocephalus</i>	Yes	Yes	Yes	Yes
Common black hawk ^h	<i>Buteogallus anthracinus</i>	Yes	Yes	Yes	Yes
Reptiles					
Narrow-headed gartersnake ⁱ	<i>Thamnophis rufipunctatus</i>	Yes	Yes	Yes	Yes
Amphibians					
Arizona toad ^l	<i>Bufo m. microscaphus</i>	No	Yes	Yes	No
Lowland leopard frog ^k	<i>Lithobates (Rana) yavapaiensis</i>	No	Yes	Yes	No
Northern leopard frog ^l	<i>Lithobates (Rana) pipiens</i>	No	Yes	Yes	No

Table 2. Forest Service sensitive species known to occur within 2 miles of the project area or for which suitable habitat or foraging habitat is present in the area.

Common Name	Scientific Name	Occupied Habitat Present?	Suitable Habitat Present?	Suitable Habitat Affected?	Species Potentially Affected?
Fish					
Desert sucker ^m	<i>Catostomus clarki</i>	Yes	Yes	Yes	Yes
Longfin dace ⁿ	<i>Agosia chrysogaster</i>	No	Yes	Yes	No
Sonoran sucker ^o	<i>Catostomus insignis</i>	Yes	Yes	Yes	Yes
Speckled dace ^p	<i>Rhinichthys osculus</i>	No	Yes	Yes	No
Invertebrates					
A Mayfly ^q	<i>Homoleptohyphes quercus</i>	Unknown	Yes	Yes	Yes
Nitocris fritillary ^r	<i>Speyeria nokomis nitocris</i>	Unknown	Yes	Yes	Yes
Nokomis fritillary ^s	<i>Speyeria nokomis nokomis</i>	Unknown	Yes	Yes	Yes
Clams					
California floater ^t	<i>Anodotona californiensis</i>	No	Yes	Yes	No
Plants					
Alcove bog orchid ^u	<i>Platanthera zothecina</i>	No	No	No	No
Arizona bugbane ^v	<i>Cimicifuga (Actaea) arizonica</i>	No	No	No	No
Eastwood alum root ^w	<i>Heuchera eastwoodiae</i>	No	No	No	No
Flagstaff pennyroyal ^x	<i>Hedeoma diffusa</i>	No	No	No	No
Lyngholm's brakefern ^y	<i>Pellaea lyngholmii</i>	No	No	No	No
Metcalfe's tick-trefoil ^z	<i>Desmodium metcalfei</i>	No	No	No	No
Mt. Dellenbaugh Sandwort ^{aa}	<i>Arenaria aberrans</i>	No	No	No	No
Rock fleabane ^{bb}	<i>Erigeron saxatilis</i>	No	No	No	No
Rusby's milkvetch ^{cc}	<i>Astragalus rusbyi</i>	No	No	No	No

^aAGFD 2001a, 2006b

^bAGFD 2002a, 2004c

^cAGFD 2003c, 2004b

^dAGFD 2003b, 2006a

^eAGFD 2003a, 2004a

^fPhillips et al. 1964, Sibley 2003

^gAGFD 2002b, 2004d

^hAGFD 2004e, 2005a

ⁱAGFD 2004f, 2009a; Rosen and Schwalbe 1988

^jAGFD 2002d, 2008c

^kAGFD 2006c, 2008a

^lAGFD 2002c, 2008b

^mAGFD 2009c

ⁿAGFD 2009b

^oAGFD 2006d

^pAGFD 2002e

^qAGFD 2004g

^rNearctica 2009; AGFD 2002f

^sNearctica 2009

^tAGFD 2001b, 2004h

^uAGFD 2004m, 2004n; SEINet 2009d

^vAGFD 2004j, 2008d

^wAGFD 2005b, 2005c

^xAGFD 2003e, 2004i

^yeFloras.org 2009; SEINet 2009c

^zKearney and Peebles 1960; SEINet 2009b

^{aa}AGFD 2004i, 2006e

^{bb}AGFD 2003d, 2004k

^{cc}Kearney and Peebles 1960; SEINet 2009a

6. MITIGATION MEASURES

Design Responsibilities

- All disturbed soils that will not be landscaped or otherwise permanently stabilized by construction will be seeded using species native to the project vicinity.

Contractor Responsibilities

- To prevent the introduction of invasive species seeds, all earthmoving and hauling equipment shall be washed at the contractor's storage facility prior to entering the construction site.
- To prevent invasive species seeds from leaving the site, the contractor shall inspect all construction equipment and remove all attached plant/vegetation and soil/mud debris prior to leaving the construction site.
- All disturbed soils that will not be landscaped or otherwise permanently stabilized by construction shall be seeded using species native to the project vicinity.
- No trees greater than 6 inches in diameter at breast height shall be removed from the project limits during the construction period.

Environmental Planning Group Responsibility

- To minimize the effects on native and stocked fishes in the project area, the Department shall hire a qualified and permitted biologist to relocate fish stranded within the project limits following diversion of Oak Creek.

7. COORDINATION

Janie Agyagos, wildlife biologist, CNF Red Rock Ranger District, provided locality records and insights into the presence or absence of several federally listed and Forest Service sensitive species in the project area.

Sabra Schwartz, AGFD HDMS program supervisor, provided locality records for several federally listed and Forest Service sensitive species in the project area.

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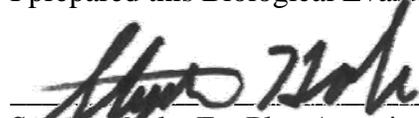
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9. ADDITIONAL INFORMATION

EcoPlan biologist Stephen Hale conducted a general biological survey of the project area on October 20, 2009, and again on November 18, 2009. During these site visits, the project limits were surveyed by means of a pedestrian survey, and a general reconnaissance was made of the project area. Notes were made concerning the habitat, a list of plants and animals seen was compiled and photos were taken of the project area.

10. SIGNATURES

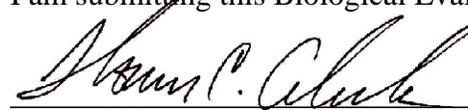
I prepared this Biological Evaluation:



Stephen Hale, EcoPlan Associates, Inc.
Senior Project Scientist

April 12, 2010
Date

I am submitting this Biological Evaluation:



Thomas C. Ashbeck, EcoPlan Associates, Inc.
Director, Biological Resources Group

April 12, 2010
Date

APPENDIXES

I. State Sensitive Species

The AGFD On-line Environmental Review Tool was accessed to determine special status species known to occur in the project vicinity. As part of the environmental review process, a letter describing the project was sent to the AGFD to inform the agency of the project and to solicit comments. The letter requested specific concerns, suggestions, or recommendations the agency may have related to the project.

The AGFD sent a response letter. The agency provided an updated On-line Environmental Review Tool response, which included a list of special status species known to occur in the project vicinity. The agency indicated that the project lies within critical habitat of the MSO and within 3 miles of designated MSO PACs, wintering habitat of the bald eagle, and known populations of several state, Forest Service, and BLM sensitive species. The listed sensitive species have been addressed in this BE. The agency also indicated that the project lies within the boundary of the Munds Mountain–Black Hills linkage design, a wildlife movement corridor. The project is limited in extent and does not lie along a potential game trail crossing Oak Creek Canyon; therefore, the project will have little to no impact on terrestrial mammal species identified as using this corridor, which would be crossing the canyon. Given the mobility of identified bird and bat species using the canyon as a riparian corridor, the project would likewise have little or no impact. The project may interrupt the passage of the speckled dace, the narrow-headed gartersnake, and the lowland and Northern leopard frog, if present, but these interruptions would be temporary. Stream flow will be diverted to permit passage during construction, and mitigation measures incorporated into the requirements for permits associated with the project will minimize downstream effects to habitat occupied or potentially occupied by these species.

II. Photo Log



Photo 1. View overlooking the bank protection project site from the driveway of the private property at the top of the cliff at the lower end of the project area, facing northeast. Note the gabion structures on the lower slope and the grass-covered earth slope above.



Photo 2. View from the base of the cliff and the lower end of the the project area, facing northeast. Note the gabion structures on the lower slope and the grass-covered earth slope above.



Photo 3. View of the opposite bank of Oak Creek from the base of the cliff at the lower end of the project area, facing north. The sunny bank lies within the limits of temporary disturbance. Grasses at the extreme right are growing from the lower gabion structures within the project limits.



Photo 4. View of the opposite bank (right) and the cliff (left) at the lower end of the project area from the top of the gabion structure near the middle of the project limits, facing west. The foreground portion of the sunny bank to the right lies within the area of temporary disturbance.



Photo 5. View from the opposite bank of Oak Creek toward the upper end of the project area, facing east. Note the diversion wall to the left, which is just upstream of the project limits.



Photo 6. View of the upper end of the project area from the opposite bank of Oak Creek, facing east. Note the cement spillway (to be removed) above the gabion structures (center right).



Photo 7. View from the opposite bank of Oak Creek showing all but the lower end of the project area, facing east. Note the relative lack of vegetation on the disturbed slope above the existing gabion structures where new gabion structures will extend to the roadway above.



Photo 8. View of the lower end of the project limits (cliff at extreme right), facing south. Note the exposed drainage pipe and the eroded slope to be corrected by the project.



Photo 9. View from the opposite bank of Oak Creek toward the middle of the project area, facing southeast. Note the disturbed slope above the existing gabion structures vegetated only by grasses, low scrubs, and scattered small trees.



Photo 10. View from the opposite bank of Oak Creek downstream toward most of the upper end of the project area, facing southeast. Note the gabion structures on the lower slope in the project area and the cliff to the right.



Photo 11. View of the diversion wall from the opposite bank of Oak Creek just upstream of the upper end of the project area, facing east.

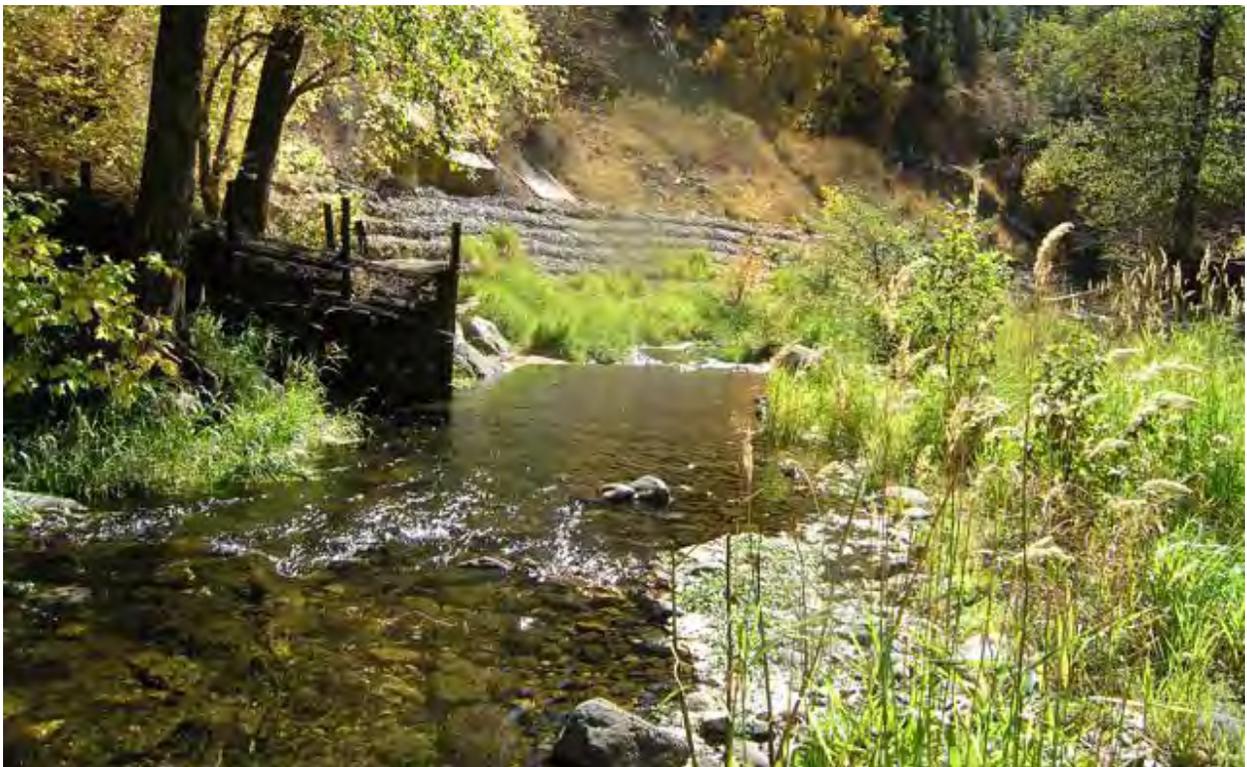


Photo 12. View of the project area from upstream of the diversion wall (left) just above the project limits, facing south.



Photo 13. View along Oak Creek from just upstream of the project area, facing north (upstream).



Photo 14. View of the project area from just off SR 89A, facing southwest. Note that the project will extend gabion structures from the existing structures to the roadway. Work will occur on the open, relatively unvegetated slope.



Photo 15. View of the lower end of the project area and the cliff forming a sharp bend in the Oak Creek flow channel, facing west–northwest, from the SR 89A roadway.



Photo 16. View of the cliff (right), exposed drainage culvert, and eroded slope to be corrected by the project, from the bank of Oak Creek at the lower end of the project area, facing south.

III. Attachments

- AGFD response letter
- USFWS response letter
- CNF scoping letters



THE STATE OF ARIZONA
GAME AND FISH DEPARTMENT

5000 W. CAREFREE HIGHWAY
PHOENIX, AZ 85086-5000
(602) 942-3000 • WWW.AZGFD.GOV

GOVERNOR
JANICE K. BREWER
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DIRECTOR
LARRY D. VOYLES
DEPUTY DIRECTORS
GARY R. HOVATTER
ROBERT D. BROSCHEID



February 8, 2010

ADOT
C/O Greg Martinsen
EcoPlan Associates, Inc.
701 W. Southern Ave., Suite 203
Mesa, AZ 85210

Re: 89A CN 365 H7418 01C
Oak Creek Canyon Bank Protection

Dear Mr. Martinsen:

The Arizona Game and Fish Department (Department) has reviewed the letter from ADOT dated January 20, 2010 regarding the above referenced project. The On-line Environmental Tool search (receipt # 20090619009095) conducted by ADOT was more than 6 months old and therefore, no longer valid. I have conducted a new search (201002080112385) which is enclosed. The attached receipt Mexican Spotted Owls and their Designated Critical Habitat as well as wintering Bald Eagles in the project vicinity. **The Department recommends you contact the U.S. Fish and Wildlife for their review of this project.**

The Department appreciates the opportunity to provide comments in the early stages of the proposed roadway project and we have no further comments at this time. If you have any questions regarding this letter, please contact me at 623 236-7513.

Sincerely,

Daniel E. Nelson
Project Evaluation Specialist

Cc: Sara Reif, AGFD; Debra Bills USFWS
M10-01210217

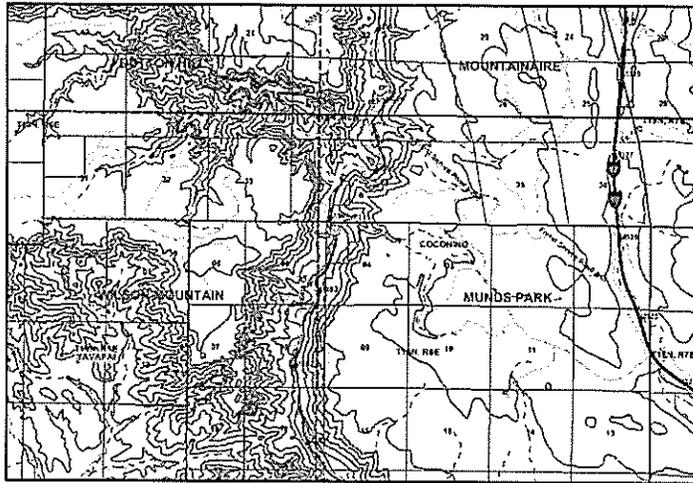
Arizona's On-line Environmental Review Tool

Search ID: 20100208011385

Project Name: Oak Creek Bank Protection

Date: 2/8/2010 10:33:03 AM

Project Location



Project Name: Oak Creek Bank Protection

Submitted By: PEP Project Evaluation Program

On behalf of: ADOT

Project Search ID: 20100208011385

Date: 2/8/2010 10:32:55 AM

Project Category: Water Use, Transfer, and Channel Activities, Impoundment (flood control, levee, dam)

Project Coordinates (UTM Zone 12-NAD 83): 432714.148, 3872292.377 meter

Project Length: 622.449 meter

County: COCONINO

USGS 7.5 Minute Quadrangle ID: 772

Quadrangle Name: MUNDS PARK

Project locality is currently being scoped

The Department appreciates the opportunity to provide in-depth comments and project review when additional information or environmental documentation becomes available.

Special Status Species Occurrences/Critical Habitat/Tribal Lands within 3 miles of Project Vicinity:

Name	Common Name	FWS	USFS	BLM	State
CH for <i>Strix occidentalis lucida</i>	Designated Critical Habitat for Mexican spotted owl				
<i>Catostomus clarkii</i>	Desert Sucker	SC	S	S	
<i>Catostomus insignis</i>	Sonora Sucker	SC	S	S	
<i>Cimicifuga arizonica</i>	Arizona Bugbane	SC	S		HS
<i>Erigeron saxatilis</i>	Rock Fleabane		S		
<i>Falco peregrinus anatum</i>	American Peregrine Falcon	SC	S	S	WSC
<i>Haliaeetus leucocephalus</i> (wintering pop.)	Bald Eagle - Winter Population	SC, BGA	S	S	WSC
<i>Hedeoma diffusa</i>	Flagstaff False Pennyroyal		S		SR
<i>Megaceryle alcyon</i>	Belted Kingfisher				WSC
Munds Mountain - Black Hills Linkage Design	Wildlife Corridor				
<i>Myotis occultus</i>	Arizona Myotis	SC			
<i>Pinicola enucleator</i>	Pine Grosbeak				WSC
<i>Rhinichthys osculus</i>	Speckled Dace	SC		S	
<i>Strix occidentalis lucida</i>	Mexican Spotted Owl	LT			WSC
<i>Thamnophis rufipunctatus</i>	Narrow-headed Gartersnake	SC	S	S	WSC

Location Accuracy Disclaimer

Project locations are assumed to be both precise and accurate for the purposes of environmental review. The creator/owner of the Project Review Receipt is solely responsible for the project location and thus the correctness of the Project Review Receipt content.

Arizona's On-line Environmental Review Tool
Search ID: 20100208011385
Project Name: Oak Creek Bank Protection
Date: 2/8/2010 10:33:03 AM

Please review the entire receipt for project type recommendations and/or species or location information and retain a copy for future reference. If any of the information you provided did not accurately reflect this project, or if project plans change, another review should be conducted, as this determination may not be valid.

Arizona's On-line Environmental Review Tool:

1. This On-line Environmental Review Tool inquiry has generated recommendations regarding the potential impacts of your project on Special Status Species (SSS) and other wildlife of Arizona. SSS include all U.S. Fish and Wildlife Service federally listed, U.S. Bureau of Land Management sensitive, U.S. Forest Service sensitive, and Arizona Game and Fish Department (Department) recognized species of concern.
2. These recommendations have been made by the Department, under authority of Arizona Revised Statutes Title 5 (Amusements and Sports), 17 (Game and Fish), and 28 (Transportation). These recommendations are preliminary in scope, designed to provide early considerations for all species of wildlife, pertinent to the project type you entered.
3. This receipt, generated by the automated On-line Environmental Review Tool does not constitute an official project review by Department biologists and planners. Further coordination may be necessary as appropriate under the National Environmental Policy Act (NEPA) and/or the Endangered Species Act (ESA).

The U.S. Fish and Wildlife Service (USFWS) has regulatory authority over all federally listed species under the ESA. Contact USFWS Ecological Services Offices: <http://arizonaes.fws.gov/>.

Phoenix Main Office
2321 W. Royal Palm Road, Suite 103
Phoenix, AZ 85021
Phone 602-242-0210
Fax 602-242-2513

Tucson Sub-Office
201 North Bonita, Suite 141
Tucson, AZ 85745
Phone 520-670-6144
Fax 520-670-6154

Flagstaff Sub-Office
323 N. Leroux Street, Suite 101
Flagstaff, AZ 86001
Phone 928-226-0614
Fax 928-226-1099

Disclaimer:

1. This is a preliminary environmental screening tool. It is not a substitute for the potential knowledge gained by having a biologist conduct a field survey of the project area.
2. The Department's Heritage Data Management System (HDMS) data is not intended to include potential distribution of special status species. Arizona is large and diverse with plants, animals, and environmental conditions that are ever changing. Consequently, many areas may contain species that biologists do not know about or species previously noted in a particular area may no longer occur there.
3. Not all of Arizona has been surveyed for special status species, and surveys that have been conducted have varied greatly in scope and intensity. Such surveys may reveal previously undocumented population of species of special concern.
4. HDMS data contains information about species occurrences that have actually been reported to the Department.

Arizona Game and Fish Department Mission

To conserve, enhance, and restore Arizona's diverse wildlife resources and habitats through aggressive protection and

management programs, and to provide wildlife resources and safe watercraft and off-highway vehicle recreation for the enjoyment, appreciation, and use by present and future generations.

Project Category: Water Use, Transfer, and Channel Activities, Impoundment (flood control, levee, dam)

Project Type Recommendations:

Based on the project type entered; coordination with Arizona Department of Environmental Quality may be required (<http://www.azdeq.gov/>).

Based on the project type entered; coordination with Arizona Department of Water Resources may be required (<http://www.water.az.gov/adwr/>)

Based on the project type entered; coordination with County Flood Control districts may be required.

Based on the project type entered; coordination with State Historic Preservation Office may be required <http://azstateparks.com/SHPO/index.html>

Based on the project type entered; coordination with U.S. Army Corps of Engineers may be required (<http://www.spl.usace.army.mil/regulatory/phonedir.html>)

Based on the project type entered; coordination with U.S. Fish and

Wildlife Service (Fish and Wildlife Coordination Act) may be required (<http://arizonaes.fws.gov/>)

Consider incorporating project components that may allow for the inclusion to promote, enhance, create, or restore wildlife habitat. Contact Project Evaluation Program for further information and opportunities - http://www.azgfd.gov/inside_azgfd/agency_directory.shtml.

During planning and construction, minimize potential introduction or spread of exotic invasive species. Invasive species can be plants, animals (exotic snails), and other organisms (e.g. microbes), which may cause alteration to ecological functions or compete with or prey upon native species and can cause social impacts (e.g. livestock forage reduction, increase wildfire risk). The terms noxious weed or invasive plants are often used interchangeably. Precautions should be taken to wash all equipment utilized in the project activities before and after project activities to reduce the spread of invasive species. Arizona has noxious weed regulations (Arizona Revised Statutes, Rules R3-4-244 and R3-4-245). See Arizona Department of Agriculture website for restricted plants <http://www.azda.gov/PSD/quarantine5.htm>. Additionally, the U.S. Department of Agriculture has information regarding pest and invasive plant control methods including: pesticide, herbicide, biological control agents, and mechanical control: <http://www.usda.gov/wps/portal/usdahome>. The Department regulates the importation, purchasing, and transportation of wildlife and fish (Restricted Live Wildlife), please refer to the hunting regulations for further information http://www.azgfd.gov/h_f/hunting_rules.shtml.

During the planning stages of your project, please consider the local or regional needs of wildlife in regards to movement, connectivity, and access to habitat needs. Loss of this permeability prevents wildlife from accessing resources, finding mates, reduces gene flow, prevents wildlife from re-colonizing areas where local extirpations may have occurred, and ultimately prevents wildlife from contributing to

Arizona's On-line Environmental Review Tool

Search ID: 20100208011385

Project Name: Oak Creek Bank Protection

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ecosystem functions, such as pollination, seed dispersal, control of prey numbers, and resistance to invasive species. In many cases, streams and washes provide natural movement corridors for wildlife and should be maintained in their natural state. Uplands also support a large diversity of species, and should be contained within important wildlife movement corridors. In addition, maintaining biodiversity and ecosystem functions can be facilitated through improving designs of structures, fences, roadways, and culverts to promote passage for a variety of wildlife.

Minimization and mitigation of impacts to wildlife and fish species due to changes in water quality, quantity, chemistry, temperature, and alteration to flow regimes (timing, magnitude, duration, and frequency of floods) should be evaluated. Minimize impacts to springs, in-stream flow, and consider irrigation improvements to decrease water use. If dredging is a project component, consider timing of the project in order to minimize impacts to spawning fish and other aquatic species (including spawning seasons), and to reduce spread of exotic invasive species. We recommend early direct coordination with Project Evaluation Program for projects that could impact water resources, wetlands, streams, springs, and/or riparian habitats.

The Department recommends that wildlife surveys are conducted to determine if noise-sensitive species occur within the project area. Avoidance or minimization measures could include conducting project activities outside of breeding seasons.

Project Location and/or Species recommendations:

Heritage Data Management System records indicate that one or more listed, proposed, or candidate species or Critical Habitat (Designated or Proposed) have been documented in the vicinity of your project (refer to page 1 of the receipt). Please contact:
Ecological Services Office
US Fish and Wildlife Service

2321 W. Royal Palm Rd.
Phoenix, AZ 85021-4951
Phone: 602-242-0210
Fax: 602-242-2513

Heritage Data Management System records indicate that one or more native plants listed on the Arizona Native Plant Law and Antiquities Act have been documented within the vicinity of your project area (refer to page 1 of the receipt). Please contact:
Arizona Department of Agriculture
1688 W Adams
Phoenix, AZ 85007
Phone: 602-542-4373

HDMS records indicate your project is in or near an identified wildlife habitat linkage corridor. Project planning and implementation efforts should focus on maintaining adequate opportunities for wildlife permeability. For information on the linkage assessment and wildlife species that may be affected refer to:
<http://www.corridordesign.org/arizona>. Contact your Arizona Game and Fish Department Regional Office for specific project recommendations:
http://www.azgfd.gov/inside_azgfd/agency_directory.shtml

Recommendations Disclaimer:

1. Potential impacts to fish and wildlife resources may be minimized or avoided by the recommendations generated from information submitted for your proposed project.
2. These recommendations are proposed actions or guidelines to be considered during **preliminary project development**.
3. Additional site specific recommendations may be proposed during further NEPA/ESA analysis or through coordination with affected agencies.
4. Making this information directly available does not substitute for the

Arizona's On-line Environmental Review Tool

Search ID: 20100208011385

Project Name: Oak Creek Bank Protection

Date: 2/8/2010 10:33:03 AM

Department's review of project proposals, and should not decrease our opportunity to review and evaluate additional project information and/or new project proposals.

5. The Department is interested in the conservation of all fish and wildlife resources, including those Special Status Species listed on this receipt, and those that may have not been documented within the project vicinity as well as other game and nongame wildlife.

6. **Further coordination requires the submittal of this initialed and signed Environmental Review Receipt with a cover letter and project plans or documentation that includes project narrative, acreage to be impacted, how construction or project activity(s) are to be accomplished, and project locality information (including site map).**

7. Upon receiving information by AZGFD, please allow 30 days for completion of project reviews. Mail requests to:

**Project Evaluation Program, Habitat Branch
Arizona Game and Fish Department
5000 West Carefree Highway
Phoenix, Arizona 85086-5000
Phone Number: (623) 236-7600
Fax Number: (623) 236-7366**

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1. This Environmental Review and project planning website was developed and intended for the purpose of screening projects for potential impacts on resources of special concern. By indicating your agreement to the terms of use for this website, you warrant that you

will not use this website for any other purpose.

2. Unauthorized attempts to upload information or change information on this website are strictly prohibited and may be punishable under the Computer Fraud and Abuse Act of 1986 and/or the National Information Infrastructure Protection Act .

3. The Department reserves the right at any time, without notice, to enhance, modify, alter, or suspend the website and to terminate or restrict your access to the website.

4. This Environmental Review is based on the project study area that was entered. The review must be redone if the project study area, location, or the type of project changes. If additional information becomes available, this review may need to be reconsidered.

5. A signed and initialed copy of the Environmental Review Receipt indicates that the entire receipt has been read by the signer of the Environmental Review Receipt.

Security:

The Environmental Review and project planning web application operates on a complex State computer system. This system is monitored to ensure proper operation, to verify the functioning of applicable security features, and for other like purposes. Anyone using this system expressly consents to such monitoring and is advised that if such monitoring reveals possible evidence of criminal activity, system personnel may provide the evidence of such monitoring to law enforcement officials. Unauthorized attempts to upload or change information; to defeat or circumvent security measures; or to utilize this system for other than its intended purposes are prohibited.

This website maintains a record of each environmental review search result as well as all contact information. This information is maintained for internal tracking purposes. Information collected in this application will not be shared outside of the purposes of the Department.

If the Environmental Review Receipt and supporting material are not mailed to the Department or other appropriate agencies within six (6)

months of the Project Review Receipt date, the receipt is considered to be null and void, and a new review must be initiated.

Print this Environmental Review Receipt using your Internet browser's print function and keep it for your records. Signature of this receipt indicates the signer has read and understands the information provided.

Signature: _____

Date: _____

Proposed Date of Implementation: _____

Please provide point of contact information regarding this Environmental Review.

Application or organization responsible for project implementation

Agency/organization: _____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____

Person Conducting Search (if not applicant)

Agency/organization: _____

Contact Name: _____

Address: _____

City, State, Zip: _____

Phone: _____

E-mail: _____



United States Department of the Interior

U.S. Fish and Wildlife Service

Arizona Ecological Services Field Office

2321 West Royal Palm Road, Suite 103

Phoenix, Arizona 85021-4951

Telephone: (602) 242-0210 Fax: (602) 242-2513



In Reply Refer to:

AESO/SE

22410-2010-CPA-0041

February 12, 2010

Arizona Department of Transportation
c/o Mr. Greg Martinsen
EcoPlan Associates, Inc.
701 West Southern Avenue, Suite 203
Mesa, Arizona 85210

RE: 89A CN 365 H7418 01C
Oak Creek Canyon Bank Protection

Dear Mr. Martinsen:

Thank you for your January 20, 2010, request for our review of the proposed Arizona Department of Transportation (ADOT) Oak Creek Canyon Bank Stabilization project along Oak Creek adjacent to State Route (SR) 89A milepost 385.1, Coconino County, Arizona. We received your request for comments on January 22, 2010. Flooding during the 2004-2005 winter storms resulted in high water flows that overtopped the existing wire mesh baskets and created eddies that undermined the existing soil. This flooding contributed to the significant erosion in the roadway embankment and damaged a culvert in the project area. The purpose of this project is to repair the existing embankment and replace or fortify existing bank protection, as warranted, and to protect SR 89A from erosion caused by high water flows in Oak Creek. Adjacent lands are under the jurisdiction of the Coconino National Forest.

The specific scope of work is detailed in your January 20, 2010, letter. During construction, the main channel of Oak Creek will be temporarily diverted within the larger high water channel. A pump will be used to dewater the main channel and to further prevent groundwater from refilling a large pool within the main channel at the south end of the project area. A crane that will be situated on SR 89A will be used to lower the pump, a small tractor, and construction materials into the work area. Project construction is tentatively scheduled for spring or fall 2010 and is expected to continue for 60 days.

Listed species that occur within the area include the threatened Mexican spotted owl (*Strix occidentalis lucida*) (MSO). The Cave Springs (#040601) protected activity center (PAC) is located west of the project area, across Oak Creek. Though the PAC appears to be somewhat topographically protected from the action area, we recommend you consider the MSO in the project analysis. In addition, the narrow-headed gartersnake (*Thamnophis rufipunctatus*) occurs

within the area and depending upon the timing of the project, there may be impacts to this species and its prey (i.e., fish) when the water is diverted out of the main channel. We are also concerned about any native fishes that might occupy the main channel in this area. We recommend that you work with us and the Arizona Game and Fish Department (AGFD) to discuss project timing and to determine whether we may wish to salvage and move aquatic species from the main channel (particularly the large pool) prior to the channel dewatering.

We appreciate your coordination on this and other projects. We also encourage you to coordinate the review of this project with Coconino National Forest and AGFD. If you have any questions in regard to our review of the project, please contact Shaula Hedwall at (928) 226-0614 (x103) or Brenda Smith (x101) of our Flagstaff Suboffice.

Sincerely,



Steven L. Spangle
Field Supervisor

cc (electronic copy):

- Chief, Habitat Branch, Arizona Game and Fish Department, Phoenix, AZ
- Regional Supervisor, Arizona Game and Fish Department, Flagstaff, AZ
- Forest Biologist, Supervisor's Office, Coconino National Forest, Flagstaff, AZ
- District Biologist, Red Rock Ranger District, Coconino National Forest, Sedona, AZ



Arizona Department of Transportation

Intermodal Transportation Division

206 South Seventeenth Avenue Phoenix, Arizona 85007-3213

Janice K. Brewer
Governor

John S. Halikowski
Director

January 28, 2010

Floyd Roehrich Jr.
State Engineer

Ms. Heather Provencio
District Ranger
Red Rock Ranger District
Coconino National Forest
P.O. Box 20429
Sedona, AZ 86339

Re: 89A CN 365 H7418 01C
Oak Creek Canyon Bank Protection

Dear Ms. Provencio:

The Arizona Department of Transportation (ADOT) is planning to repair and replace the rock-filled wire mesh basket bank protection along Oak Creek adjacent to State Route (SR) 89A milepost (MP) 385.1 in Coconino County, Arizona (Figure 1–Project location). The bank protection is designed to protect SR 89A from erosion caused by high water flows of Oak Creek. Adjacent lands are under the jurisdiction of the Coconino National Forest (CNF). The cadastral location for this project is Township 19 North, Range 6 East, Section 34 on the Munds Park (1965), Arizona, US Geological Service 7.5-minute topographic series map (Figure 2-Project vicinity).

Flooding during the 2004–2005 winter storms resulted in high water flows that overtopped the existing wire mesh baskets and created eddies that undermined the existing soil. This flooding contributed to significant erosion in the roadway embankment and damaged a culvert in the project area. The purpose of this project is to repair the existing embankment and replace or fortify existing bank protection, as warranted.

The scope of work for this project consists of:

- Replacing and fortifying existing rock-filled wire mesh bank protection for the full height of the east embankment slope of Oak Creek Canyon along an approximate 150-foot length of the creek. For the baskets in good condition, new baskets will be fastened to them to fortify them. Baskets in poor condition will be replaced with new baskets.
- Repairing the corrugated metal pipe at the south end of the project.
- Removing the existing concrete spillway and installing a concrete slab with wire mesh reinforcement at the edge of the roadway.

During construction, the low-flow channel of Oak Creek (main channel) will be temporarily diverted within the larger high water channel. A pump will be used to dewater the main channel and to further prevent groundwater from refilling a large pool within the main channel at the south end of the project area. A crane that will be situated on SR 89A will be used to lower the pump, a small tractor, and construction materials into the work area.

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Project construction is tentatively scheduled for spring or fall 2010 and is expected to continue for 60 working days. Construction will not occur during the summer monsoon season. A permanent easement and a temporary construction easement from the CNF may be required for this project. At least one lane of traffic will remain open at all times, and access to adjacent properties will be maintained throughout construction.

During the biological compliance process, we will coordinate with Janie Agyagos, who, according to our records, is the appropriate contact for biological issues. Please let us know if this contact has changed and whether your agency has specific biological concerns.

Please submit your comments or concerns by February 19, 2010, to ADOT c/o Greg Martinsen via e-mail at gmartinsen@ecoplanaz.com; by phone at 480.733.6666, ext. 111; by fax at 480.733.6661; or mail them to:

Arizona Department of Transportation
c/o Greg Martinsen
EcoPlan Associates, Inc.
701 W. Southern Ave., Suite 203
Mesa, AZ 85210

Thank you for your time and assistance.

Sincerely,

A handwritten signature in black ink that reads "Jerry Monks". The signature is written in a cursive, slightly slanted style.

Jerry Monks
Environmental Planning Group

Enclosures: Figure 1–Project location
Figure 2–Project vicinity

c: Janie Agyagos, Red Rock Ranger District, Coconino National Forest
Greg Martinsen, EcoPlan Associates, Inc.



Arizona Department of Transportation
Intermodal Transportation Division

206 South Seventeenth Avenue Phoenix, Arizona 85007-3213

Janice K. Brewer
Governor

John S. Halikowski
Director

January 28, 2010

Floyd Roehrich Jr.
State Engineer

Ms. Janie Agyagos
Wildlife Biologist
Red Rock Ranger District
Coconino National Forest
P.O. Box 20429
Sedona, AZ 86339

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Please respond if you have biological issues or sensitive species concerns related to this project. We will send the biology document to your agency for approval when it is complete. Thank you in advance for your cooperation and assistance.

Please submit your comments or concerns by February 19, 2010, to ADOT c/o Greg Martinsen via e-mail at gmartinsen@ecoplanaz.com; by phone at 480.733.6666, ext. 111; by fax at 480.733.6661; or mail them to:

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