

BIOLOGICAL ASSESSMENT

PARALLEL FLOW 200 TPH DRUM MIX HOT ASPHALT PLANT

Prepared for
YAVAPAI-APACHE SAND & ROCK
3750 W. OLD HIGHWAY 279
CAMP VERDE, ARIZONA 86322

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INTRODUCTION

The purpose of this biological assessment is to review a proposed hot mix asphalt plant project on the extent the proposed action may affect any of the threatened, endangered, proposed, or sensitive species listed below. This biological assessment is prepared in accordance with legal requirements set forth under the Endangered Species Act (16 U.S.C. 1536 (c)). This document only addresses the expected effects to federally listed species and state species of concern; it does not address any other environmental resources such as greenhouse gasses or cultural resources.

No direct impacts to federally listed species will occur because of the asphalt plant and any indirect effects are insignificant and immeasurable. The Verde River, located approximately 3,100 feet from the project boundary (Figure 1), is designated as Critical or Proposed Critical Habitat for the many of the listed species analyzed in this document. However, no Critical Habitat occurs on the project site. The Yavapai-Apache Sand and Rock has a stormwater pollution prevention plan in place to avoid any potential degradation of the Verde River water quality resulting from stormwater runoff during and after development operations.

LOCATION

The project area is in Section 11, T14N, R4E. The area is southwest of Middle Verde and the Camp Verde Indian Reservation on the Middle Verde and Cornville, AZ USGS 7.5-minute quadrangles (Figure 1). Elevation ranges between 3,170 and 3,200 feet. The area lies in the Verde River valley; the Verde River serves as the major drainage in the region and the only perennial water source near the project area. The Verde Valley area comprises a transition zone between the high elevation Colorado Plateau physiographic province and the low deserts of the Basin and Range province south of the Black Hills (Brown 1994).

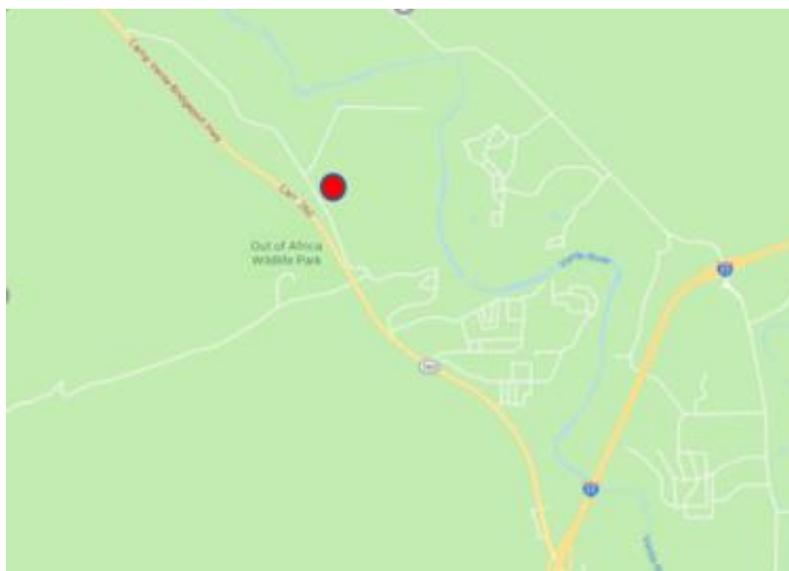


Figure 1 General Location map of proposed hot asphalt plant. Red dot indicates plant location.

ACTION AREA

Elevation ranges between 3,170 and 3,200 feet. The area lies in the Verde River valley; the Verde River serves as the major drainage in the region and the only perennial water source near the project area. The Verde valley area comprises a transition zone between the high elevation Colorado Plateau physiographic province and the low deserts of the Basin and Range province south of the Black Hills (Brown 1994).

The project area is underlain by the Verde Formation. This formation consists of limestone beds alternating with fluvial deposits; of silt and sand, resulting from the formation's history as lake deposition (Chronic 1983, Nations and Stump 1981). Soils within the parcel are generally rocky or sandy, derived from decomposition of the Verde formation (Hendricks 1985). The site location for the asphalt plant is within the area currently mined as a sand and gravel operation (Figure 2). The site is devoid of vegetation, has multiple building units (Figure 3), and frequent vehicle and large equipment traffic. The closest habitat is approximately 800 feet west of the plant location and is comprised of catclaw acacia (*Acacia greggii*), mesquite (*Prosopis velutina*), one-seed juniper (*Juniperus monosperma*), soapweed yucca (*Yucca elata*), and Engelmann's prickly pear (*Opuntia phaeacantha* var. *discata*). It is not habitat for any of the Listed species, but is utilized by some of the species of concern (Appendix I and II). Wildlife observed in this section included Gambel's quail (*Lophortyx gambeli*) and desert cottontail (*Sylvilagus audubonii*).

CURRENT MANAGEMENT

The property is privately held by the Yavapai-Apache Nation and is managed as a gravel and rock mining operation. This project proposal is to add the hot asphalt plant within the existing mining operations on land that has already been mined and is devoid of habitat. Once mining is complete, some or all of the 230-acre site is expected to be revegetated and used for agricultural purposes.

PROJECT DESCRIPTION

The proposed project is a Portable Parallel Flow 200 TPH Drum Mix Asphalt Plant (similar to Figure 4) consisting of the following major components:

- A. 7' diameter x 34' long drum mixer with burner, slinger conveyor and discharge hood and recycle collar.
- B. 8' x 20' control house with EZ-Blend asphalt blending controls, feeder bin controls, burner controls, totalizer, damper controls, motor push button panel, MCC, with all cables pre-wire, with plug-in connectors.
- C. (4) Cold feed bins, size 9' x 14', collecting conveyor
- D. 45' long weigh conveyor, 4' x 6' scalping screen

- E. 75-ton silo, cone heated and fully insulated
- F. 225 Ton per hour (TPH) drag elevator 5,000# batcher for loading trucks. However, the plant will probably only result in 185 tph because of elevation and moisture in the aggregate material being used.
- G. Asphalt injection pump and meter, unloading pump, fuel pump
- H. 20,000-gallon direct heated asphalt tank
- I. 42,000 cfm baghouse with interconnecting ducting to drum mixer
- J. (2) 25 hp air compressors.



Figure 2 Proposed site of hot asphalt plant.

Although potentially a portable unit, this plant is planned to be permanent but will run only daylight hours during the week and be closed on most weekends. Truck traffic will be approximately 50 loads hot asphalt per month or 600 loads per year. The first year of asphalt production is estimated to be 12,000 tons divided by 185 tons per hour = 65 hours run time for the year. In subsequent years, the production target is 25,000 to 30,000 tons per year for 163 hours run time. The fuel type is natural gas, and with relatively low production levels, the emission and noise levels are calculated well below NSR major source thresholds in the EPA Permit Application (Figure 5). Noise emissions are expected to be insignificant given the plant location will be at least 3100 feet from the riparian zone, resulting in dBA of 36, lower than current levels of truck traffic operating closer to the riparian zone in other operations (Figure 6).



Figure 3 Photo looking southwest from site location towards office trailer.

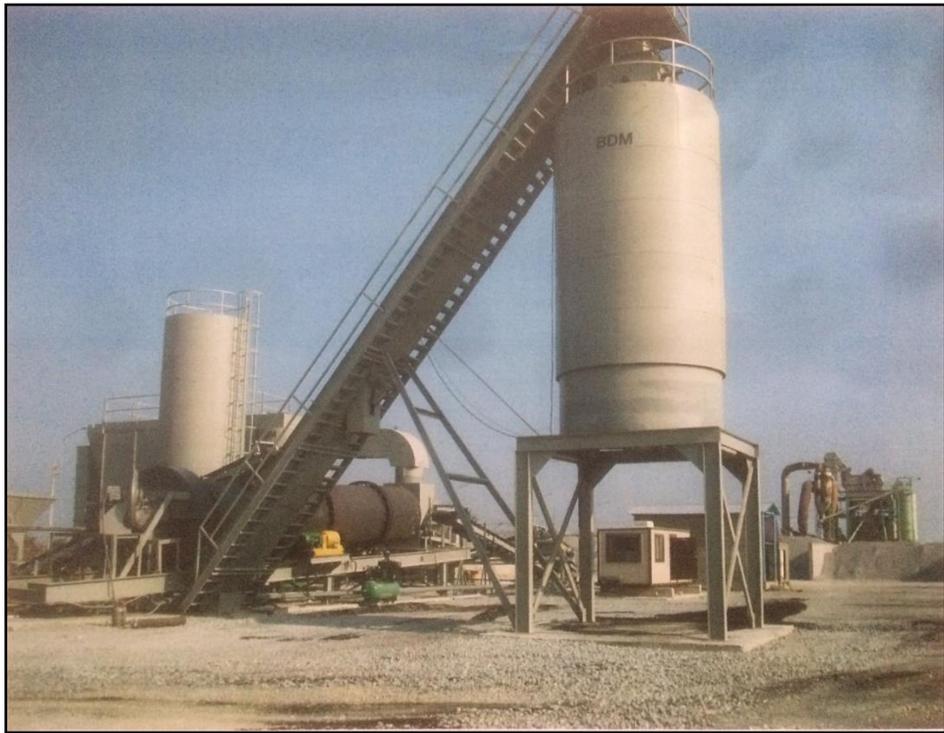


Figure 4. Example of a hot asphalt batch plant like the one proposed for this project.

Pollutant	PM	PM ₁₀ ²	PM _{2.5} ³	SO ₂	NO _x	CO	VOC
<i>Emission Factor Threshold¹ (lb/MMSCF)</i>	0.2	0.7	0.7	0.0	13	84	5.5
Proposed Plant's PTE (ton/yr)	0.01	0.03	0.03	0.00	0.43	0.36	0.02
Notes: ¹ Emission factors are from AP-42, Chapter 1.4, Tables 1.4-1 and 1.4-2 (updated 07/98). ² PM ₁₀ emission factor is condensable and filterable PM combined. PM emission factor is for filterable PM only. ³ Assume PM _{2.5} emissions are equal to PM ₁₀ emissions.							

Figure 5 Worst Case Potential to Emit (PTE) (ton/yr) expected for Yavapai-Apache Sand & Rock Asphalt Plant. PTE (ton/yr) is calculated using the following formula: PTE= Heat Input (MMBtu/hr) x 1 MMSCF/1,020 MMBtu x EF (lb/MMSCF) x 8760 hr/yr x 1 ton/2000 lb.

<u>Noise Level</u>	<u>Distance from Center of Plant</u>
85 dBA	50 feet (measured reference level)
78 dBA	100 feet
70 dBA	200 feet
63 dBA	400 feet
55 dBA	800 feet
46 dBA	1,600 feet
36 dBA	3,200 feet (The approximate closest distance of the plant to the Verde River)
24 dBA	6,400 feet

Figure 6 The typical noise emissions from a Hot-Mix Asphalt Plant. We do not know the assumptions that went into the measurements in this noise summary table.

SPECIES CONSIDERED

The list below of Endangered and Threatened species was obtained from the US Fish and Wildlife Service' IPAC system and the Arizona Game and Fish On-Line Environmental Tool.

SPECIES COMMON NAME	SCIENTIFIC NAME	CRITICAL HABITAT	STATUS
Northern Mexican Gartersnake	<i>Thamnophis eques megalops</i>	Critical proposed	Threatened
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>	Critical proposed	Threatened
Roundtail Chub	<i>Gila robusta</i>	None	Proposed Threatened
Headwater Chub	<i>Gila nigra</i>	None	Proposed Threatened
Southwestern Willow Flycatcher	<i>Empidonax traillii extimus</i>	Critical	Endangered
Gila Chub	<i>Gila intermedia</i>	Critical	Endangered
Razorback Sucker	<i>Xyrauchen texanus</i>	Critical	Endangered
Loach Minnow	<i>Tiaroga cobitis</i>	Critical	Endangered
Spikedace	<i>Meda fulgida</i>	Critical	Endangered
Woundfin	<i>Plagopterus argentissimus</i>	None	EXPN
Arizona Cliffrose	<i>Purshia (=Cowania) subintegra</i>	None	Endangered
Narrow-headed Gartersnake	<i>Thamnophis rufipunctatus</i>	Critical proposed	Threatened

The effects analysis took into consideration the current condition of the proposed project site (within active gravel and rock mining site and devoid of vegetation), the distance of the site from the nearest habitat and riparian zone (Figure 7) and a berm or ridge of land that surrounds the site.

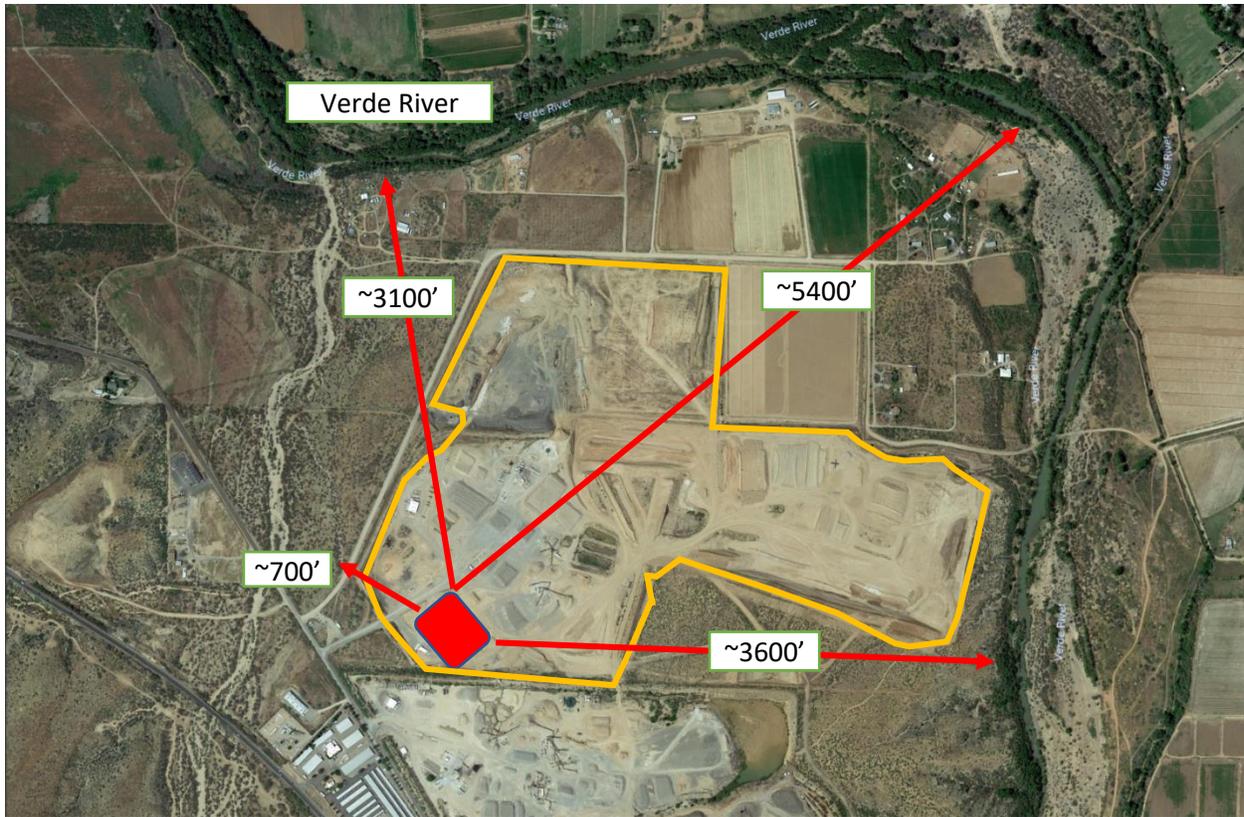


Figure 7 Site location of proposed Hot Asphalt Batch Plant. Red rectangle represents approximate footprint of construction and operation. Orange line indicates approximate location of stormwater containment berm.

ANALYSIS OF SPECIES EFFECTS

BIRDS

Southwestern Willow Flycatcher (*Empidonax traillii extimus*) Endangered

Although there is final critical habitat designated for this species, the project location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/6749>

Habitat and description:

The southwestern willow flycatcher is an insectivorous, neotropical migrant that breeds in the southwestern United States and winters in Mexico and Central America. It is found in riparian habitats along perennial drainages where dense growth of willows, tamarisk, and other shrubs and medium-sized trees are present with a scattered overstory of cottonwoods. Breeding and foraging occurs throughout this habitat (Spencer et al. 1996). In Arizona, southwestern willow

flycatchers arrive and begin to nest in late May and begin their southward migration by mid-August (Sogge et al. 1997).

Determination of effect:

A no effect determination is recommended due to no habitat for this species occurring on the project site. The southwestern willow flycatcher requires riparian forest with multiple vegetation layers. No effect to the species is anticipated because the project area does not contain perennial waters, nor does it support the vegetation layers suitable for habitat. The closest habitat is over 3100 feet away. The berm surrounding the entire sand and gravel operation contains surface stormwater, debris and pollutants. The surface within the project site is denuded of vegetation and surface water quickly drains.

If a migrating bird were to pass through the project site during construction, it would most likely avoid the immediate area.

Yellow-billed (*Cuckoo Coccyzus americanus*) Threatened

Although there is proposed critical habitat for this species, the project location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/3911>

Habitat and description:

The yellow-billed cuckoo is a medium (12 inches long) neotropical migrant that winters in Central and South America. In the United States it is found in riparian woodlands and thickets dominated by cottonwoods and willows at elevations below 5,000 feet (Corman and Magill 2000). Yellow-billed cuckoos typically nest on horizontal branches 6-25 feet off the ground, mostly in willow or other dense deciduous vegetation close to water. They require a minimum of 25 acres of broad leaf forest at least 100 m wide (Gaines 1974) and at least 2.5 acres of dense nesting habitat per pair (Laymon and Haltennan 1989). In Arizona, pairs are usually distributed every 0.5 mile in large blocks of contiguous habitat. Currently, cuckoos breed in disjunct riparian habitats in the west. In Arizona, it is found in mature cottonwood-willow riparian habitats along central and southern drainages and locally along the Virgin River (AGFD 1996). Cuckoos feed almost entirely on grasshoppers, cicadas, katydids, and caterpillars, though occasionally berries and fruit may be taken (AGFD 2002i).

Determination of effect: A no effect determination is recommended due to no habitat for this species occurring on the project site. The closest habitat is over 3100 feet away. The berm surrounding the entire sand and gravel operation contains surface stormwater, debris and pollutants. The surface within the project site is denuded of vegetation and surface water quickly drains.

A conservation measure is to avoid construction or maintenance activities within 500 feet of suitable yellow-billed cuckoo migration, nesting, and foraging habitat between May 15 and September 30.

REPTILES

Northern Mexican Gartersnake (*Thamnophis eques megalops*) Threatened

Although there is proposed critical habitat for this species, the project location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/7655>

Habitat and description:

The stout-bodied Northern Mexican gartersnake reaches a maximum length of 44 in (112 cm), with females larger than males. The background color ranges from olive to olive-brown to olive gray. A portion of the lateral stripe occurring on the fourth scale row, distinguish *T. eques* from other gartersnake species.

A pair of large brown spots, extends along the dorsolateral fields, and a light-colored crescent extends behind the corners of the mouth. *T. e. megalops* occurs in fragmented populations within the middle/upper Verde River drainage (including Oak Creek and the Verde River), middle/lower Tonto Creek, and the Cienega Creek drainage, as well as a small number of isolated wetland habitats in southeastern portions of the state. In Arizona, three general habitat types are used: 1) source area ponds and cienegas; 2) lowland river riparian forests and woodlands; 3) upland stream gallery forests.

Determination of effect:

A no effect determination is recommended due to no habitat for this species occurring on the project site. The closest habitat is over 3100 feet away. The berm surrounding the entire sand and gravel operation contain surface stormwater, debris and pollutants. The surface within the project site is denuded of vegetation and surface water quickly drains.

FISH

Gila Chub (*Gila intermedia*) Endangered

Although there is final critical habitat designated for this species, the project location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/51>

Habitat and description:

The Gila chub is endemic to the Gila River Basin, occurring throughout small and medium sized tributaries, especially cienegas, in the headwaters of essentially all the major tributaries to the Gila River, including the Verde, Agua Fria, Aravaipa, San Pedro, and Santa

Cruz drainages (AGFD 1996). It has recently been rediscovered in the San Pedro drainage in Sonora, Mexico, where it had not been collected since 1857 (AGFD 2002c). Gila chub typically occupy pools in small streams, marshes, cienegas, and other quiet waters, at an elevational range between 2,000 and 3,500 feet (USFWS 1998). It is highly secretive, remaining in deeper waters near cover. Spawning typically occurs in late spring through early summer (AGFD 1996). The Gila chub feeds mainly on invertebrates, and occasionally on other fish species (AGFD 1996).

Determination of effect:

A no effect determination is recommended due to no habitat for this species occurring on the project site. The closest habitat is over 3100 feet away. The berm surrounding the entire sand and gravel operation contains surface stormwater, debris and pollutants.

Headwater Chub (*Gila nigra*) Proposed Threatened

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/1373>

Habitat description:

Body thick and chunky to streamlined, but not markedly attenuate. Maximum size is about 50 cm (19.7 in); Coloration is dark olive-gray or brown above; silver side, white below. Similar species include the humpback chub (*Gila cypha*) and bonytail chub (*G. elegans*). In Arizona, they are identified from Ash Creek (tributary to San Carlos River), Tonto Creek (tributary to the Salt River), and Spring and Marsh Creeks, (tributaries of Tonto Creek). In the Verde River system, they inhabit Upper Fossil Creek (above the diversion dam), East Verde River and Deadman Creek.

Determination of effect:

A no effect determination is recommended due to no habitat for this species occurring on the project site. The closest habitat is over 3100 feet away. Headwater chub are not currently known in the Verde River near the project site. The berm surrounding the entire sand and gravel operation contains surface stormwater, debris and pollutants.

Loach Minnow (*Tiaroga cobitis*) Endangered

Although there is final critical habitat designated for this species, the project location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/6922>

Habitat and description:

The loach minnow inhabits turbulent, rocky riffles of mainstream rivers and tributaries up to about 7,200 feet elevation. It is restricted almost exclusively to a bottom-dwelling habitat, swimming above the substrate for only brief moments as it darts from place to place. Adult loach

minnow are typically found in water flowing 2 to 2.5 feet per second and 6 to 7 inches deep where they occupy the interstices of cobble-size substrate (these habitats occasionally have dense growths of filamentous algae). Larval and juvenile loach minnow are usually found in shallower, slower water over sand substrate.

Determination of effect:

A no effect determination is recommended due to no habitat for this species occurring on the project site. The closest habitat is over 3100 feet away. The berm surrounding the entire sand and gravel operation contains surface stormwater, debris and pollutants.

Razorback Sucker (*Xyrauchen texanus*) Endangered

Although there is final critical habitat designated for this species, the project location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/530>

Habitat and description:

Razorback suckers can attain lengths of three feet and weights exceeding six pounds (AGFD 2002d). They historically inhabited streams greater than one meter deep over sand, mud, or gravel substrates (Minckley 1973). They tend to occupy areas with strong, uniform currents over sandy bottoms, and eddies and backwaters lateral to the river channels, sometimes concentrating in deep places near cut banks or fallen trees. Except for spawning migrations, razorback suckers are fairly sedentary, moving relatively few miles over several months. Spawning occurs from late winter to early summer along gravelly shorelines or bays (AGFD 2002d). In the Green River during non-breeding season, the fish are found in depths of 2 to 11 feet over sand or silt substrates, with water velocities of 0.3 to 2.0 feet per second. During summer months use shifts to relatively shallow waters off mid-channel sandbars. This species formerly occurred throughout the Colorado River basin. Currently, populations in the lower basin are restricted to Lake Mohave, Lake Mead, and possibly the lower Colorado River below Havasu Creek (USFWS 1998). Substantial numbers of razorback suckers were reared through the juvenile and adult stages in hatcheries and in isolated ponds and released with limited success (AGFD 2002d).

Determination of effect:

A no effect determination is recommended due to no habitat for this species occurring on the project site. The closest habitat is over 3100 feet away. The berm surrounding the entire sand and gravel operation contains surface stormwater, debris and pollutants.

Roundtail Chub (*Gila robusta*) Proposed Threatened

Although there is final critical habitat designated for this species, the project location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/2782>

Habitat and description:

Roundtail chub occupy cool to warm water, mid-elevation streams and rivers. Typical adult microhabitat consists of pools up to eight feet deep adjacent to swifter riffles and runs. This chub prefers habitat with cover that consists of large boulders, tree rootwads, submerged large trees and branches, undercut cliff walls, or deep water. Smaller chubs generally occupy shallower, low velocity water adjacent to overhead bank cover (AGFD 2002h). Roundtail chub appear to be very selective in their choice of pools, they may be common in certain pools, but not in similar, nearby pools. Spawning takes place over gravel substrate (AGFD 200211). This species was historically distributed throughout the larger tributaries of the Colorado River basin from Wyoming to Arizona and New Mexico. Because of river impoundment and stream diversion, and predation by nonnative fishes, the Roundtail chub is rare in most of the larger portions of the Salt, Verde, and Gila rivers (AGFD 2002h).

Determination of effect:

A no effect determination is recommended due to no habitat for this species occurring on the project site. The closest habitat is over 3100 feet away. The berm surrounding the entire sand and gravel operation contains surface stormwater, debris and pollutants.

Spikedace (*Meda fulgida*) Endangered

Although there is final critical habitat designated for this species, the project location is outside the critical habitat.

<https://ecos.fws.gov/ecp/species/6493>

Habitat and description:

Spikedace bodies are slender, more strongly compressed at the caudal peduncle, and when compared to similar species other than the woundfin, appear to have more brilliant silver coloration on the sides. The spikedace most closely resembles the woundfin in morphology, however it is easily distinguishable from the woundfin by noting the lack of barbels on the spikedace which are small but present on the woundfin. Maximum length rarely exceeds 75.0 mm (2.95 in.). Presently, the only extant natural population known in Arizona is a 24 km (15 mile) reach of Aravaipa Creek in Graham and Pinal counties. Fish have been stocked in 5 other locations: Fossil Creek, Redfield Canyon, Hot Springs Canyon, Bonita Creek and the Blue River, but these are not yet considered to be established populations. According to the 2012 uplisting package, spikedace in Arizona are restricted to Aravaipa Creek, Eagle Creek, and the Verde River, but have not been collected in the latter two locations for over a decade.

Determination of effect:

A no effect determination is recommended due to no habitat for this species occurring on the project site. The closest habitat is over 3100 feet away. Spikedace have not been located in

the Verde river in the last decade and so are likely not present near the project site. The berm surrounding the entire sand and gravel operation contains surface stormwater, debris and pollutants.

Woundfin (*Plagopterus argentissimus*) EXPN (Experimental non-essential population)

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/49>

Habitat and description:

A small slender, silvery, scaleless minnow. Head and belly flattened, and mouth small and nearly horizontal. Coloration silvery over-all. They have no scales, and their long snout has barbels located at the corner of the mouth. They can be distinguished from spinedace and spinedace by the presence of barbels. Woundfin has wider, flatter head than spinedace and lacks the scales seen in spinedace. Historic range includes the lower Colorado River basin including the Virgin, Moapa, Salt and Gila River systems. At present, the woundfin are restricted to approximately 50 miles of perennial reaches of the Virgin River in the states of Utah, Arizona, and Nevada.

Determination of effect:

A no effect determination is recommended due to no habitat for this species occurring on the project site. The closest habitat is over 3100 feet away. The berm surrounding the entire sand and gravel operation contains surface stormwater, debris and pollutants.

PLANTS

Arizona Cliffrose (*Purshia (=Cowania) subintegra*) Endangered

No critical habitat has been designated for this species.

<https://ecos.fws.gov/ecp/species/866>

Habitat and description:

Arizona cliffrose occurs on rolling, rocky, limestone hills and slopes within Sonoran Desertscrub (AGFD 1997a). The species occurs where the winters are mild, summers are hot, and the 9 - 34 in. of rainfall is evenly distributed between summer and winter rainfall periods. This species is restricted to calcareous limy-tuff soils derived from Tertiary lacustrine deposits that are nutrient deficient but high in lithium, nitrates, and magnesium (USFWS 1992, ARPC 2000). Crucifixion-thorn (*Canotia holacantha*) is the most common plant associate.

Determination of effect:

A no effect determination is recommended due to the lack of nutrient-deficient, calcareous limy-tuff soils required for Arizona cliffrose on the project site. In addition, none were observed during field surveys.

ADDITIONAL CRITICAL HABITATS

Potential effects to critical habitat(s) in this location must be analyzed along with the endangered species themselves. Although the species is not known to occur within 2 miles of the project, this location overlaps the critical habitat for the:

Narrow-headed Gartersnake (*Thamnophis rufipunctatus*) Threatened with Proposed Critical Habitat

Although there is proposed critical habitat for this species, the project location is outside the critical habitat.

Habitat and description:

A medium-sized snake, reaching an average length of 112 cm (44 in). The eyes are set high and they have a blunt-nosed, narrow and very elongated head. These snakes are only found in areas of high native fish concentration and primarily consume fish, including speckled dace, Gila mountain sucker, and red shiner (Rosen and Schwalbe, 1988). In Arizona, they are in riparian areas within pinyon-juniper and pine-oak woodland into ponderosa pine forest; in permanently flowing streams, sometimes sheltered by broadleaf deciduous trees. Important components of bank vegetation include shrub-sized and sapling Arizona alder (the most conspicuous species), velvet ash, willows and canyon grape.

Determination of effect:

A no effect determination is recommended due to no habitat for this species occurring on the project site. The closest habitat is over 3100 feet away. The berm surrounding the entire sand and gravel operation contains surface stormwater, debris and pollutants.

SPECIES OF CONCERN:

The species listed in Appendices I and II are species of concern or are protected by the Migratory Bird Act and/or the Bald and Golden Eagle Act. There may be the rare occasion for individuals of some of the species to arrive on or near the project site. However, in most cases, the animals will likely avoid the area due to human presence, trucks and other activities. The site is already devoid of vegetation and receives high levels of activity from mining operations. By following the conservation measures below, most effects will be avoided or minimized. The operators of the mine and asphalt plant are encouraged to be aware of animals approaching the site, and when necessary contact a biologist to discuss any options for preventing harm to the species.

GENERAL EFFECTS

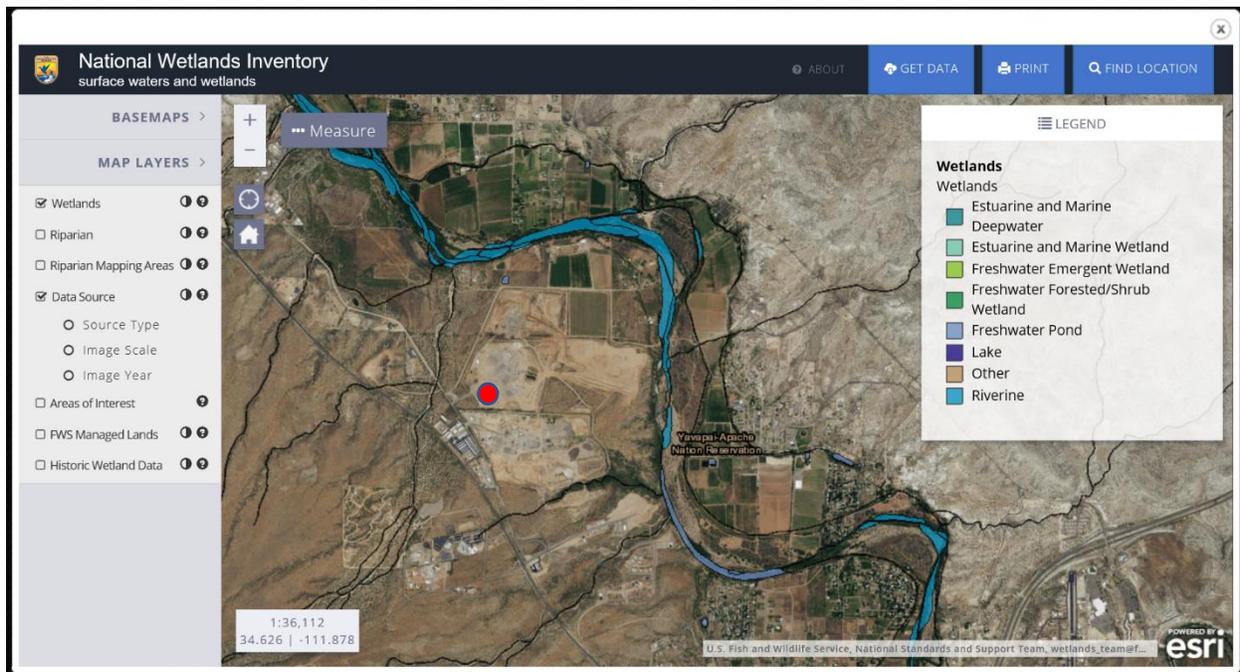
The project is not likely to cause air emissions that would create objectionable odors affecting the evaluated species. The only known potential source of odors may be diesel exhaust from trucks. The plant will operate from natural gas supply. Given the plant location is over ½ mile from the riparian zone and 1 mile from the nearest human residence, odor impacts should not be significant. Noise effects to riparian zone and human residents should be less than 36 dBA.

Any potential effects can be also be minimized by incorporating the following conservation measures:

- Locating borrow pits in a manner and location that avoids or minimizes impacts to sensitive species and habitats. Do not utilize borrow pits within the 100-year floodplain. No debris should be buried within the 100-year floodplain.
- Refueling should occur away from all riparian habitat and outside of the high-water mark. If refueling must be done within the 100-year floodplain, a rubberized barrier should be placed under the equipment to catch all spills and leaks.
- Minimizing off-road travel of vehicles or pedestrians to the maximum extent possible. Utilize established roads and paths when available. Ingress and egress of heavy equipment should be limited to non-vegetated areas and avoid damaging riparian vegetation. Vehicle travel should not occur within the stream channel.
- Minimize the removal of vegetation to only what is necessary and within the footprint of the project. Selective cutting is preferable over clearing. Leaving the root zone in areas where native vegetation has been removed is encouraged.
- While all effort should be focused on preventing the loss, fragmentation, modification, or degradation of species habitat, negative effects to habitat should be offset by replacing these habitats with permanently protected habitat that is managed for the benefit of the species within the same geographic or management unit. Habitat offsets should occur at a rate compensable with the quality of affected habitat and should not include the use of federal lands that would otherwise qualify for protection if the standards set forth in the Recovery Plan or other agency guidance were applied to those lands. Habitat may be permanently protected through easements, fee title acquisitions, the establishment of trusts, etc.
- All petroleum, oil, and lubricants (POL) should be stored on a non-permeable membrane with raised sides to prevent spills from entering the habitat before clean-up. POLs should be stored away from riparian habitat and outside of the high-water mark.
- All imported materials (e.g. gravel, soil) should be certified to be free of herbicides, pesticides, petroleum products, or other contaminants that may alter water quality.

Wetlands in the National Wetlands Inventory

There are no wetlands within the project footprint. The closest wetlands are riverine, located along the Verde River at least 3,100 feet from project site.



REFERENCES

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APPENDIX I- Arizona Game and Fish Department Project ID: HGIS-06618

Review

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Special Status Species and Special Areas Documented within 2 Miles of Project Vicinity

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
<i>Agosia chrysogaster</i>	Longfin Dace	SC		S		1B
<i>Aix sponsa</i>	Wood Duck					1B
<i>Ammodramus savannarum perpallidus</i>	Western Grasshopper Sparrow					1B
<i>Ammospermophilus harrisi</i>	Harris' Antelope Squirrel					1B
<i>Anaxyrus microscaphus</i>	Arizona Toad	SC		S		1B
<i>Aquila chrysaetos</i>	Golden Eagle	BGA		S		1B
<i>Aspidoscelis flagellicauda</i>	Gila Spotted Whiptail					1B
<i>Baeolophus ridgwayi</i>	Juniper Titmouse					1C
<i>Botaurus lentiginosus</i>	American Bittern					1B
<i>Buteo regalis</i>	Ferruginous Hawk	SC		S		1B
<i>Buteo swainsoni</i>	Swainson's Hawk					1C
<i>Buteogallus anthracinus</i>	Common Black Hawk					1C
<i>Calypte costae</i>	Costa's Hummingbird					1C
<i>Castor canadensis</i>	American Beaver					1B
<i>Catostomus clarkii</i>	Desert Sucker	SC	S	S		1B
<i>Catostomus insignis</i>	Sonora Sucker	SC	S	S		1B
<i>Chordeiles minor</i>	Common Nighthawk					1B
<i>Cistothorus palustris</i>	Marsh Wren					1C
<i>Coccyzus americanus</i>	Yellow-billed Cuckoo (Western DPS)	LT	S			1A
<i>Coluber bilineatus</i>	Sonoran Whipsnake					1B
<i>Corynorhinus townsendii pallescens</i>	Pale Townsend's Big-eared Bat	SC	S	S		1B
<i>Crotalus cerberus</i>	Arizona Black Rattlesnake					1B
<i>Empidonax traillii extimus</i>	Southwestern Willow Flycatcher	LE				1A
<i>Empidonax wrightii</i>	Gray Flycatcher					1C
<i>Eriogonum ripleyi</i>	Ripley Wild-buckwheat	SC	S		SR	
<i>Euderma maculatum</i>	Spotted Bat	SC	S	S		1B

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
<i>Eumops perotis californicus</i>	Greater Western Bonneted Bat	SC		S		1B
<i>Falco peregrinus anatum</i>	American Peregrine Falcon	SC	S	S		1A
<i>Gila intermedia</i>	Gila Chub	LE				1A
<i>Gila robusta</i>	Roundtail Chub	CCA	S	S		1A
<i>Haliaeetus leucocephalus</i>	Bald Eagle	SC, BGA	S	S		1A
<i>Heloderma suspectum</i>	Gila Monster					1A
<i>Incilius alvarius</i>	Sonoran Desert Toad					1B
<i>Kinosternon sonoriense sonoriense</i>	Desert Mud Turtle			S		1B
<i>Lasiurus blossevillii</i>	Western Red Bat		S			1B
<i>Leopardus pardalis</i>	Ocelot	LE				1A
<i>Lithobates pipiens</i>	Northern Leopard Frog		S	S		1A
<i>Lithobates yavapaiensis</i>	Lowland Leopard Frog	SC	S	S		1A
<i>Lontra canadensis lataxina</i>	Southeastern River Otter					1B
<i>Lontra canadensis sonora</i>	Southwestern River Otter	SC				1B
<i>Meda fulgida</i>	Spikedace	LE				1A
<i>Melanerpes uropygialis</i>	Gila Woodpecker					1B
<i>Melospiza lincolnii</i>	Lincoln's Sparrow					1B
<i>Melospiza aberti</i>	Abert's Towhee		S			1B
<i>Micrathene whitneyi</i>	Elf Owl					1C
<i>Microtus mexicanus</i>	Mexican Vole					1B
<i>Micruroides euryxanthus</i>	Sonoran Coralsnake					1B
<i>Myiarchus tyrannulus</i>	Brown-crested Flycatcher					1C
<i>Myotis occultus</i>	Arizona Myotis	SC		S		1B
<i>Myotis velifer</i>	Cave Myotis	SC		S		1B
<i>Myotis yumanensis</i>	Yuma Myotis	SC				1B
<i>Odocoileus virginianus</i>	White-tailed Deer					1B
<i>Oreoscoptes montanus</i>	Sage Thrasher					1C
<i>Oreothlypis luciae</i>	Lucy's Warbler					1C
<i>Panthera onca</i>	Jaguar	LE				1A
<i>Passerculus sandwichensis</i>	Savannah Sparrow					1B
<i>Poeciliopsis occidentalis occidentalis</i>	Gila Topminnow	LE				1A
<i>Progne subis hesperia</i>	Desert Purple Martin		S			1B

Scientific Name	Common Name	FWS	USFS	BLM	NPL	SGCN
<i>Ptychocheilus lucius</i>	Colorado Pikeminnow	LE, XN				1A
<i>Rhinotropis rusbyi</i>	Rusby's Milkwort			S		
<i>Rhinichthys osculus</i>	Speckled Dace	SC		S		1B
<i>Salvia dorrii</i> ssp. <i>mearnsii</i>	Verde Valley Sage	SC	S		SR	
<i>Setophaga petechia</i>	Yellow Warbler					1B
<i>Sphyrapicus nuchalis</i>	Red-naped Sapsucker					1C
<i>Sphyrapicus thyroideus</i>	Williamson's Sapsucker					1C
<i>Spizella atrogularis</i>	Black-chinned Sparrow					1C
<i>Spizella breweri</i>	Brewer's Sparrow					1C
<i>Sturnella magna</i>	Eastern Meadowlark					1C
<i>Tadarida brasiliensis</i>	Brazilian Free-tailed Bat					1B
<i>Thamnophis eques megalops</i>	Northern Mexican Gartersnake	LT	S			1A
<i>Thamnophis rufipunctatus</i>	Narrow-headed Gartersnake	LT	S			1A
<i>Troglodytes pacificus</i>	Pacific Wren					1B
<i>Vireo bellii arizonae</i>	Arizona Bell's Vireo					1B
<i>Vireo vicinior</i>	Gray Vireo		S			1C
<i>Vulpes macrotis</i>	Kit Fox No Status					1B
<i>Xyrauchen texanus</i>	Razorback Sucker	LE				1A
<i>Callipepla gambelii</i>	Gambel's Quail					
<i>Odocoileus hemionus</i>	Mule Deer					
<i>Odocoileus virginianus</i>	White-tailed Deer					1B
<i>Patagioenas fasciata</i>	Band-tailed Pigeon					

LEGEND

FWS= Fish and Wildlife Service

LE Listed Endangered: imminent jeopardy of extinction.
 LT Listed Threatened: imminent jeopardy of becoming Endangered.
 XN Experimental Nonessential population.

SC Species of special concern

USFS= US Forest Service and BLM= Bureau of Land Management

S Sensitive

NPL= Plants – NPL Arizona Native Plant Law (2008)
[Arizona Department of Agriculture Protected Plants](#)

HS Highly Safeguarded: no collection allowed.
SR Salvage Restricted: collection only with permit.
ER Export Restricted: transport out of State prohibited.
SA Salvage Assessed: permits required to remove live trees.
HR Harvest Restricted: permits required to remove plant by-products.

SGCN= Species of Greatest Conservation Need (2012)

Tiers

1A **Scored “1” for Vulnerability in at least one of the eight categories and matches at least one of the following:** Federally listed as endangered or threatened under the Endangered Species Act (ESA); Candidate species under ESA; Is specifically covered under a signed conservation agreement (CCA) or a signed conservation agreement with assurances (CCAA); Recently removed from ESA and currently requires post-delisting monitoring; Closed season species (i.e., no take permitted) as identified in Arizona Game and Fish Commission Orders 40, 41, 42 or 43.

1B **Scored “1” for Vulnerability in at least one of the eight categories,** but match none of the above criteria.

1C **Unknown status species. Scored “0” for Vulnerability in one of the eight categories,** meaning there are no data with which to address one or more categories, and vulnerability status cannot be assessed. These species are those for which we are unable to assess status, and thus represent priority research and information needs. As more information becomes available, their tier status will be re-evaluated.

APPENDIX II- Migratory birds (from US FWS IPAC report)

Certain birds are protected under the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. Any activity that results in the take (to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct) of migratory birds or eagles is prohibited unless authorized by the U.S. Fish and Wildlife Service. There are no provisions for allowing the take of migratory birds that are unintentionally killed or injured. Any person or organization who plans or conducts activities that may result in the take of migratory birds is responsible for complying with the appropriate regulations and implementing appropriate conservation measures, as described below.

1. The Migratory Birds Treaty Act of 1918.
2. The Bald and Golden Eagle Protection Act of 1940.
3. 50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)

Additional information can be found using the following links:

- Birds of Conservation Concern <http://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php>

- Measures for avoiding and minimizing impacts to birds

<http://www.fws.gov/birds/management/project-assessment-tools-and-guidance/conservation-measures.php>

The birds listed below are birds of concern either because they occur on the USFWS Birds of Conservation Concern (BCC) list or are known to have vulnerabilities in your project location. This is not a list of every bird you may find in this location, nor a guarantee that every bird on this list will be found in your specific project area. To see maps of where birders and the general public have sighted birds in and around your project area, visit E-bird tools such as the E-bird data mapping tool (search for the scientific name of a bird on your list to see specific locations where that bird has been reported to occur within your project area over a certain time-frame) and the E-bird Explore Data Tool (perform a query to see a list of all birds sighted in your county or region and within a certain time-frame). For projects that occur off the Atlantic Coast, additional maps and models detailing the relative occurrence and abundance of bird species on your list are available. Links to additional information about Atlantic Coast birds, and other important information about your migratory bird list can be found below.

NAME	BREEDING SEASON
<p>Bald Eagle (<i>Haliaeetus leucocephalus</i>)</p> <p>This is not a Bird of Conservation Concern (BCC), but is of concern in this area either because of the Eagle Act, or for potential susceptibilities from certain types of development or activities.</p> <p>https://ecos.fws.gov/ecp/species/1626</p>	Mar 20 to Sep 15
<p>Bendire's Thrasher (<i>Toxostoma bendirei</i>)</p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska. https://ecos.fws.gov/ecp/species/9435</p>	Mar 15 to Jul 31
<p>Black Throated Sparrow (<i>Amphispiza bilineata</i>)</p> <p>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA.</p>	Mar 15 to Sep 5
<p>Black-chinned Sparrow (<i>Spizella atrogularis</i>)</p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/9447</p>	Apr 15 to Jul 31
<p>Blue-throated Hummingbird (<i>Lampornis clemenciae</i>)</p> <p>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA.</p>	Feb 15 to Oct 10
<p>Elf Owl (<i>Micrathene whitneyi</i>)</p> <p>This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA.</p> <p>https://ecos.fws.gov/ecp/species/9085</p>	May 1 to Jul 15
<p>Gilded Flicker (<i>Colaptes chrysoides</i>)</p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/2960</p>	May 1 to Aug 10
<p>Golden Eagle (<i>Aquila chrysaetos</i>)</p> <p>This is not a Bird of Conservation Concern (BCC), but is of concern in this area either because of the Eagle Act, or for potential susceptibilities from certain types of development or activities.</p> <p>https://ecos.fws.gov/ecp/species/1680</p>	Apr 1 to Aug 31
<p>Gray Vireo (<i>Vireo vicinior</i>)</p> <p>This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.</p> <p>https://ecos.fws.gov/ecp/species/8680</p>	May 10 to Aug 20
<p>Lark Bunting (<i>Calamospiza melanocorys</i>)</p>	Breeds elsewhere

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA.

Lewis's Woodpecker (*Melanerpes lewis*)

Apr 20 to Sep 30

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9408>

Mexican Whip-poor-will (*Antrostomus arizonae*)

May 1 to Aug 20

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Phainopepla (*Phainopepla nitens*)

Mar 1 to Aug 20

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA.

<https://ecos.fws.gov/ecp/species/1372>

Pinyon Jay (*Gymnorhinus cyanocephalus*)

Feb 15 to Jul 15

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/9420>

Red-faced Warbler (*Cardellina rubrifrons*)

May 10 to Jul 15

This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA.

Rufous Hummingbird (*Selasphorus rufus*)

Breeds elsewhere

This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

<https://ecos.fws.gov/ecp/species/8002>

Avoidance and minimization measures should be implemented to reduce impacts to birds on your list, and all other birds that may occur in your project area. Nationwide Standard Conservation Measures can be applied for any project, regardless of project type or location.

If measures exist that are specific to your activity or to any of the species on your list that are confirmed to exist at your project area, these should also be considered for implementation in addition to the Nationwide Standard Conservation Measures. Implementation of avoidance and minimization measures is particularly important for BCC birds of rangewide concern. If your project has the potential to disturb or kill eagles, you will need to obtain a permit to avoid violating the BGEPA should such impacts occur.