BIOLOGICAL ASSESSMENT

OF

JOSEPHINE WASH RESTORATION PROJECT

December x , 2019

Prepared for

YAVAPAI APACHE NATION

ENVIRONMENTAL PROTECTION DEPARTMENT

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1.0 Introduction

This Project was developed and supported by the Yavapai Apache Nation (YAN) Environmental Protection Department to restore or enhance approximately 16 acres of native riparian and upland habitat within the area known as Josephine Wash. It is a tributary to the Verde River with reduced water flows due to upstream diversion into an adjacent channel. Josephine wash connects to the Verde River approximately 6100 feet downstream of the east end of the Project.

The primary purposes are to increase wildlife habitat, improve recreation opportunities for Tribal members and to provide cultural opportunities by increasing availability of cottonwood and willows for basketmaking and other purposes. Seasonal flooding that provided alluvial seed beds of native cottonwood and willow have ceased to occur due to upstream diversions of runoff. This necessitates human intervention to prepare seedbeds, plant dormant cuttings and monitor the plantings until adequate numbers are established. Wildlife observations, particularly resident and migratory bird populations, have declined with the loss of suitable cottonwood/willow and bulrush/cattail habitat. Additionally, urban development in the uplands west and south of the Project have increased soil erosion, introduced invasive species, and accumulation of trash within the riparian zone.

This project was developed to compliment on-going YAN's Verde River protection and enhancement programs as well as non-Tribal programs such as the Verde River Cooperative Invasive Plant Management Plan (CIPMP).

There are three main goals of the Project are to:

1) Remove invasive plant species using by hand and mechanical techniques
2) Replant native species including cottonwood and willow
3) Conduct monitoring of native plant growth and health.

1.1 Project Location

The project site is located along the northern edge of the YAN Clarkdale Reservation Community (Figure 1-1). Houses with fenced backyards line the southern edge of the Project boundary. The Cement plant road forms the western edge, a railroad line forms the eastern edge and open range uplands form the northern boundary. Access by vehicles is through the housing community via Bonnaha Ave off of Clarkdale's Main street. Foot access can be obtained from Cement plant road or through the housing area.

Although the riparian zone is labeled Riverine and Freshwater Emergent wetland (Appendix 1), the channel receives substantially less water than in the past due to upstream diversion into another channel. Most of the year it is remains dry except for short periods following precipitation events. The water table is also lower but is currently maintained approximately 2 feet below the lowest surface.

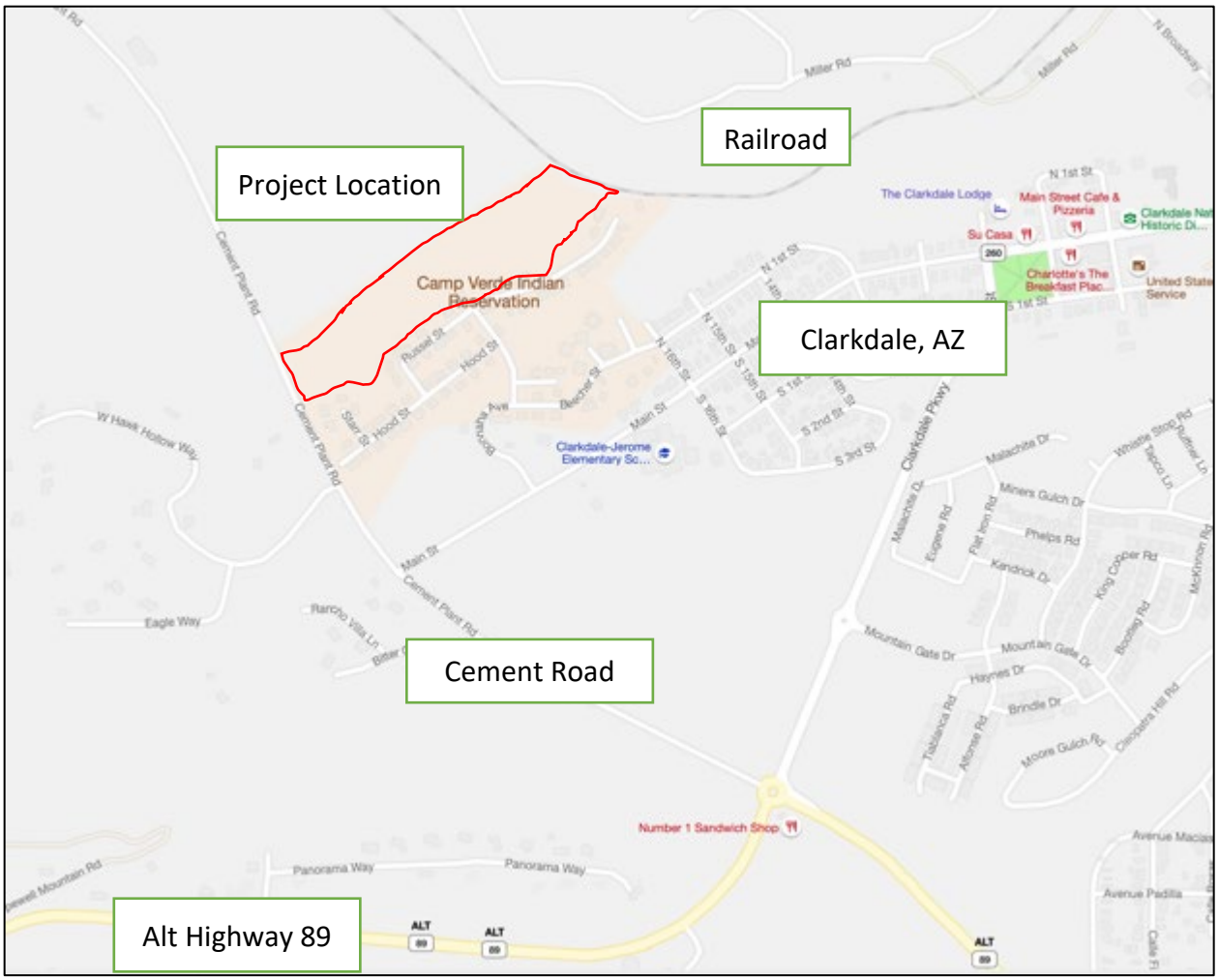

Figure 0-1. Location Map- Josephine Wash

2.0 DESCRIPTION OF THE PROPOSED ACTION

Brush Management: The removal or control of woody (non-herbaceous or succulent) plants, primarily Salt Cedar (*Tamarix ramosissima*) and Tree of Heaven (*Ailanthus altissima*). Brush management will be applied in a manner to achieve the desired control of the target woody species and protection of desired species including spot treatment of individual plants or areas needing re-treatment due to regrowth, resprouting, or reoccurrence. This will be accomplished by hand cutting and mechanical methods, either alone or in combination. See Figures 2-1, 2-2 and 2-3 below for specific areas of treatment. Cutting and chipping of material will commence after a pedestrian survey to identify and mark active nests of migratory birds. Primary treatment will be by chainsaw, although some stumps must be removed by backhoe. A front-end loader may be used near an established roadway to transport material for chipping. Herbicide application will occur from late summer to late winter. Procedures and timing for

treatment will follow NRCS guidelines found in the Field Office Technical Guide, Section IV, under 314-Brush Management: https://efotg.sc.egov.usda.gov/#/details.

Herbaceous weed treatment: The removal or control of herbaceous weeds, primarily Arundo (aka Giant Reed) (*Arundo donax*), and Horehound (*Marrubium vulgare*- suspected). Arundo will be cut by hand and/or mechanically, then treated with a direct application herbicide at the base. Horehound will be treated with a spray-on herbicide from a backpack sprayer. Procedures and timing for treatment will follow NRCS guidelines found in the Field Office Technical Guide, Section IV, under315-Herbaceous Weed Treatment: https://efotg.sc.egov.usda.gov/#/details.

Trash Removal: Trash items on the site include recent household waste such as bottle, cans, old clothing and other rubbish, but also present are older items such as washers, barrels and even an old car (Figure 2-4). As many items as possible will be collected into pickup trucks and hauled away to a designated landfill. Vehicles will remain on the two-track roadway with materials hauled to the vehicles by hand.

Tree and Shrub Planting: Once the above actions are completed, crews will plant dormant willow whips and cottonwood poles by hand with some areas near roadway dug by backhoe. Planting density will be approximately 120 trees per acres, and trees will be planted where depth tom ground water is 4 feet or less. Procedures and timing for plantings will follow NRCS guidelines found in the Field Office Technical Guide, Section IV, under 614-Tree and Shrub Planting: https://efotg.sc.egov.usda.gov/#/details.

Riparian herbaceous cover: Grasses, sedges, rushes, ferns, legumes, and forbs tolerant of intermittent flooding or saturated soils, will be established or managed as an understory vegetation in the transitional zone between upland and aquatic habitats. Seeding will be broadcast by hand and loosely "covered" by hand dragging brush and/or rakes over as the seeded areas unless other vegetation prevents this action. In that case, seed will be applied at a double rate. Procedures and timing for broadcast seeding will follow NRCS guidelines found in the Field Office Technical Guide, Section IV, under 390-Riparian herbaceous seeding: https://efotg.sc.egov.usda.gov/#/details.

Post-implementation monitoring: Yan Tribal members will conduct monitoring at the project site utilizing a tiered approach of both qualitative and quantitative methods. The monitoring will determine if management objectives were met, if plantings become established and growth rates of selected individuals, replacement needs of any plants that don't survive, and water quality testing conducted downstream as part of the YAN's clean water Act Section 106 Monitoring Plan. Parameters monitored include nutrients (Total N and P), E. coli bacteria, pH, conductivity and suspended sediment concentration.

Figure 2-1. Approximately western third of Project area. White = Tamarisk removal. Yellow= Arundo removal. Red = Tree of Heaven removal.

Figure 2-2. Approximately middle third of Project area. White = Tamarisk removal.

Figure 2-3. Approximately eastern third of Project area. White = Tamarisk removal. Yellow= Arundo removal. Red = Tree of Heaven removal.

Figure 2-4. Example of trash within Project area targeted for removal during project.

3.0 SPECIES CONSIDERED

The list below of Endangered and Threatened species was obtained from the US Fish and Wildlife Service' IPAC system: US Fish and Wildlife Service: Information for Planning and Application (IPAC) 2019. https://ecos.fws.gov/ipac/. Species list, migratory birds list, individual species biological information.

SPECIES COMMON NAME	SCIENTIFIC NAME	CRITICAL HABITAT	STATUS
Southwestern Willow Flycatcher	*Empidonax traillii extimus*	Critical	Endangered
Yellow-billed Cuckoo	*Coccyzus americanus*	Proposed Critical	Threatened
Northern Mexican Garter snake	*Thamnophis eques megalops*	Proposed Critical	Threatened
Loach Minnow	*Tiaroga cobitis*	Critical	Endangered
Razorback Sucker	*Xyrauchen texanus*	Critical	Endangered
Spikedace	*Meda fulgida*	Critical	Endangered
Woundfin	*Plagopterus argentissimus*	None	EXPN
Arizona Cliffrose	*Purshia (=Cowania) subintegra*	None	Endangered

3.1 Species Analysis

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. While habitat characteristics vary across the subspecies range, there are some common general features. Breeding sites typically consist of dense vegetation in the patch interior or an aggregate of dense patches interspersed with openings. In most cases, this dense vegetation occurs within

the first 10-13 feet above the ground. These dense patches are often interspersed with small openings, open water or marsh, or shorter/sparser vegetation, creating a mosaic that is not uniformly dense. Breeding and foraging occur 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 inadequate 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 or intermittent waters, nor does it contain the minimum average width or acreage of nesting habitat. The restoration efforts are not likely to establish minimum nesting. habitat for the species, although it may reach usable migration habitat. A draft Wildlife Habitat Evaluation Guide (WHEG) from NRCS for the species had overall score of 0.14 on a scale of 0 to 1.0.

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 Verde River (AGFD 1996). Cuckoos feed almost entirely on grasshoppers, cicadas, katydids, and caterpillars, though occasionally berries and fruit may be taken (AGFD 2002).

Determination of effect:
A **NO EFFECT** determination is recommended due to inadequate habitat for this species occurring on the project site. Although cottonwood and mesquite are present, the cottonwoods are few and widely spaced. The habitat is at least 6100 feet from potential habitat along the Verde River.

REPTILES

Northern Mexican Garter snake *(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 garter snake 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 garter snake 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 inadequate habitat for this species occurring on the project site. A draft Wildlife Habitat Evaluation Guide (WHEG) from NRCS for the species had overall score of 0.06 on a scale of 0 to 1.0.

FISH

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 6100 feet away. The riparian area does not have perennial water and is confined by obstructive culverts on each end. Sediment retention by CMs will prevent measurable effects downstream.

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 la1eral 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 6100 feet away at the Verde River. The riparian area does not have perennial water and is confined by obstructive culverts on each end. Sediment retention by CMs will prevent measurable effects downstream.

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 6100 feet away. The riparian area does not have perennial water and is confined by obstructive culverts on each end. Sediment retention by CMs will prevent measurable effects downstream. Spikedace have not been located in the Verde river in the last decade and so are likely not present near the project site.

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 spikedace and spinedace by the presence of barbels. Woundfin has wider, flatter head than spikedace 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 6100 feet away. The riparian area does not have perennial water and is confined by obstructive culverts on each end. Sediment retention by CMs will prevent measurable effects downstream.

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. The closest known population is on the opposite side of the Verde River and upstream of the project location. In addition, none were observed during field surveys.

Table 3-1. Summary of Section 7 Effects Determinations

Common Name	Effects Determination
Southwestern willow flycatcher	**No Effect.** Habitat Score 0.14. Outside critical habitat.
Western yellow-billed cuckoo	**No effect.** Outside of or not adjacent to potentially suitable habitat. Outside proposed critical habitat
Northern Mexican Garter snake	**No Effect.** Habitat score 0.06. Outside critical habitat.
Loach minnow	**No Effect.** Outside of or not adjacent to potentially suitable habitat. No perennial flow; stream segment isolated. Outside critical habitat.
Razorback sucker	**No Effect.** Outside of or not adjacent to potentially suitable habitat. No perennial flow; stream segment isolated. Outside critical habitat.
Spikedace	**No Effect.** Outside of or not adjacent to potentially suitable habitat. No perennial flow; stream segment isolated. Outside critical habitat.
Woundfin	**No Effect.** Outside of or not adjacent to potentially suitable habitat. No perennial flow; stream segment isolated. No critical habitat designated.
Arizona cliffrose	**No Effect.** Not known at site; not observed; soils not conducive for establishment. No critical habitat designated.

4.0 MIGRATORY BIRDS

NAME **BREEDING SEASON**

Bald Eagle *(Haliaeetus leucocephalus)* Mar 20 to Sep 15
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.
https://ecos.fws.gov/ecp/species/1626

Black Throated Sparrow *(Amphispiza bilineata)* Mar 15 to Sep 5
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA.

Black-chinned Sparrow *(Spizella atrogularis)* Apr 15 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.
https://ecos.fws.gov/ecp/species/9447

Black-throated grey warbler (*Dendroica nigrescens*) May 1 to Jul 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA.

Common Blackhawk *(Buteogallus anthracinus)* Apr 1 to Sep 20
This is a Bird of Conservation Concern (BCC) only in particular Bird Conservation Regions (BCRs) in the continental USA.

Golden Eagle *(Aquila chrysaetos)* Apr 1 to Aug 31
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.
https://ecos.fws.gov/ecp/species/1680

Lark Bunting *(Calamospiza melanocorys)* 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

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

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

Rufus-winged sparrow (*Aimophila carpalis*) Jun 15 to Sep 30
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

Virginia's warbler (Vermivora virginae) May 1 to Jul 31
This is a Bird of Conservation Concern (BCC) throughout its range in the continental USA and Alaska.

5.0 PROPOSED CONSERVATION MEASURES (CM) FOR T/E AND MIGRATORY BIRDS

CM 1. Limited Disturbance. Limited Project Footprint. Areas of planned disturbance to be clearly marked with flags and shown on project plans. Discussion with contractors prior to commencement of work shall emphasize travel limits and other CMs.

CM 2. Species Conservation Measures. 1) Avoidance of nests of migratory birds: A pedestrian, pre-construction survey will occur no more than 3 days before construction and will identify any active nests with a 50-meter buffer (approximately 150 feet) and classified as an avoidance area. This requires that the area be clearly marked on the plan designs and in the field as an area to avoid, and that all contractors are made aware of this restriction during the pre-construction meeting. 2) Timing of activities: If permits are obtained in time, restoration activities are planned for January-March to minimize habitat disturbance during occupation by most migrant species. 3) Prior to vegetation clearing, a biological monitor will ensure that the limits of construction have been properly staked and are readily identifiable. Any associated project activities that are inconsistent with the applicable conservation measures, and activities that may result in the take of migratory birds will be immediately halted and reported to the appropriate Service office within 24 hours.

CM 3. Prevent Introduction/Spread of Invasive Plants or Animals. 1) Clean Equipment. Vehicles and equipment will be cleaned with high-pressure water before mobilization to the project site to prevent accidental introduction/spread of aquatic invasive species or invasive plants. Additionally, if a project site has invasive species, then equipment will be cleaned before moving to the next project. All wheels, tracks, undercarriages, fenders, blades, buckets, and the exterior body will be cleaned. 2) Preserve Topsoil. When excavating, store the topsoil separately from the subsoil. When backfilling, replace the topsoil to the natural grade to provide a healthy plant growing medium. 3] Re-vegetate. Plant or seed soil-disturbed ground to reduce opportunities of invasive weed establishment. NRCS, or their planning designee, can provide seed mix/planting guidelines that includes species appropriate to the local ecology and adapted to local conditions (seed will be required to be certified weed-free). Mulching (preferably hydro mulching) may be required on large impacted areas. Revegetation shall occur as soon as practicable following construction.

CM 4. Prevent Contaminants/Damages. 1] Contaminant Prevention. Fueling and storage areas will occur outside of the designated restoration area on previously disturbed areas directed by the YAN EPD and will have a secondary containment system. 2] Responding to Contaminant Spills. Work crews will carry spill cleanup kits, be knowledgeable on safety/cleanup procedures, and will immediately clean grease, oil, or other contaminant spills. Equipment with leaks at the project site will not be allowed to continue operating until the leak is fixed. 3] Wildfire. During state, county or local burn bans or wildfire concerns, work crews will have a fire suppression kit, be knowledgeable on suppression/safety procedures, and will immediately take actions to suppress the fire. 4] Sediment Control. Measures will be used to reduce impacts of sedimentation on sensitive areas). Erosion control measures typically include straw wattles, silt curtains, cofferdams, dikes, straw bales, or other suitable measures.

6.0 REFERENCES

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APPENDIX 1. NATIONAL WETLANDS INVENTORY

NWI: R4SBC

Type: Riverine

Size: 0.938 acres

R System **Riverine** : The Riverine System includes all wetlands and deepwater habitats contained within a channel, with two exceptions: (1) wetlands dominated by trees, shrubs, persistent emergents, emergent mosses, or lichens, and (2) habitats with water containing ocean-derived salts of 0.5 ppt or greater. A channel is an open conduit either naturally or artificially created which periodically or continuously contains moving water, or which forms a connecting link between two bodies of standing water.

4 Subsystem **Intermitten** : This Subsystem includes channels that contain flowing water only part of the year. When the water is not flowing, it may remain in isolated pools or surface water may be absent.

SB Class **Streambed** : Includes all wetlands contained within the Intermittent Subsystem of the Riverine System and all channels of the Estuarine System or of the Tidal Subsystem of the Riverine System that are completely dewatered at low tide.

C Class **Seasonally Flooded** : Surface water is present for extended periods especially early in the growing season, but is absent by the end of the growing season in most years. The water table after flooding ceases is variable, extending from saturated to the surface to a water table well below the ground surface.

NWI: PEM1A

Type: Freshwater Emergent Wetland

Size: 2.31 acres

P System **Palustrine** : The Palustrine System includes all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such wetlands that occur in tidal areas where salinity due to ocean-derived salts is below 0.5 ppt. It also includes wetlands lacking such vegetation, but with all of the following four characteristics: (1) area less than 8 ha (20 acres); (2) active wave-formed or bedrock shoreline features lacking; (3) water depth in the deepest part of basin less than 2.5 m (8.2 ft) at low water; and (4) salinity due to ocean-derived salts less than 0.5 ppt.

EM Class **Emergent** : Characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens. This vegetation is present for most of the growing season in most years. These wetlands are usually dominated by perennial plants.

1 Subclass **Persistent** : Dominated by species that normally remain standing at least until the beginning of the next growing season. This subclass is found only in the Estuarine and Palustrine systems.

A Class **Temporary Flooded** : Surface water is present for brief periods (from a few days to a few weeks) during the growing season, but the water table usually lies well below the ground surface for the most of the season.

APPENDIX 2. STREAM VISUAL ASSESSMENT PROTOCOL

AZ-SVAP2 Scores. (6 and greater meets Quality Criteria)

Element	Score	Suspected causes of scores < 10	Primary Resource Concern(s)	NRCS Practices to Improve score
1. Channel Condition	8	Past incision, channel connected to floodplain	Soil Erosion- Bank	332, 386, 393, 342, 528, 580, 584
2. Hydrologic Alteration	5	Natural flows routed to another drainage.	Excess / Inefficient Water; Insufficient Water	390, 391, 393
3. Bank Condition	7	Recreational use, past bank Erosion; runoff from roads	Soil Erosion- Bank; Water Quality – - Excessive Sediment	322, 332, 342, 390, 391, 395, 393, 580
4. Riparian Area Quantity	5	Natural community ~50%	Degraded Plant Condition- Inadequate Structure/ and Composition; Inadequate Habitat for Fish and Wildlife	390, 391, 612, 657, 659, 580
5. Riparian Area Quality	5	Estimated Ecological Site Similarity index of 40; Invasive species ~50%	Degraded Plant Condition- Inadequate Structure/ and Composition; Undesirable Plant Productivity and Health; Wildfire Hazard; Inadequate Habitat for Fish and Wildlife	314, 338, 390,391, 395, 643, 647
6. Canopy Cover	7	~60% shaded	Degraded plant condition- Inadequate Structure; Inadequate Habitat for Fish and Wildlife	390, 391, 612, 644
7. Water Appearance	4	Estimated as not flowing; Upland housing runoff and' Trash in drainage	Water Quality Degradation – Nutrients, Pathogens, Pollutants, Sediment	528, 595, 657, 659
8. Nutrient Enrichment	8	Estimated; low livestock & Nutrient inputs	Water Quality Degradation – Nutrients, Elevated Temperature	528, 659
9. Pools	5	Estimated- not flowing	Inadequate Habitat for Fish and Wildlife	395, 659, 644, 528
10. Barriers to Movement	4	Water diversion and Culverts at each end	Inadequate Habitat for Fish and Wildlife	396, 314, 500
11. Fish Habitat Complexity	NA	Stream flows absent	Inadequate Habitat for Fish and Wildlife	395, 649, 657, 659, 644
12. Aquatic Invertebrate Habitat	6	Lacks flow and riffles	Inadequate Habitat for Fish and Wildlife	395, 580, 649, 644
13. Aquatic Invertebrate Community	NA	Not flowing	Inadequate Habitat for Fish and Wildlife	395, 580, 649, 644
14. Riffle Embeddedness	5	Estimated as flows diverted	Water Quality Degradation – Sediment; Soil Erosion; Inadequate Habitat for Fish and Wildlife	322, 390, 528

15. Salinity	**NA**	**None observed; no tests**	**Water Quality Degradation – Salinity**	**390, 393**

A. Sum of all elements scored __69_____

B. Number of elements scored ___12_____

Overall score: A/B __5.75_____

1 to 2.9	Severely Degraded	3 to 4.9	Poor	**5 to 6.9 Fair**
7 to 8.9	Good	9 to 10	Excellent	

C. Site Diagram: indicate approximate scale, major features, resource concerns etc.

APPENDIX 3. SUPPORTING PHOTOS OF PROJECT.

Photo 1. Looking east from western edge of Project. Photo taken from Cement Plant Road.

Photo 2. Under largest cottonwood near western edge of project.

Photo 3. Looking west at embankment of Cement Plant Road. Tree of Heaven and Tamarisk targeted for removal.

Photo 4. Hole dug in bottom of drainage near east end of Project showing ground water level.

Photo 5. East end of project- terminates at entrance of culvert. Note young shoots of Tree of Heaven.