



Smith Basin Improvement Project

Appendix C

Smith Basin Improvement Project Biological Assessment, Orange
County Water District, October 2019

Smith Basin Improvement Project Biological Assessment



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October 2019

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SUMMARY

Purpose and Need

This document constitutes notification and a request by the Orange County Water District to the U.S. Army Corps of Engineers to authorize a Section 404 Permit for the Smith Basin Improvement Project. The purpose of the Smith Basin Improvement Project is to increase the geotechnical stability of embankment slopes within Smith Basin below Villa Park Road, preventing further slope degradation and potential damage to the road. Portions of the embankment slopes have been eroded from seasonal water runoff, major flood events and water impoundment, posing a public safety and health threat to properties and infrastructure surrounding Smith Basin. This Biological Assessment identifies applicable laws and regulations that apply to biological resources within the project area; documents existing biological resources and the potential for sensitive species to occur on the project site; and evaluates potential project impacts and mitigation measures to avoid and minimize potential impacts to sensitive biological resources.

Project Activities

The Smith Basin Improvement Project proposes to move approximately 200,000 cubic yards of sediment and rock from the basin interior to repair eroded slopes on the south and western sides of the basin, re-establishing a 2:1 slope. Future slope stability would be facilitated with the addition of 6 groins extending out from the southern toe-of-slope, along with two sills placed in the basin interior to slow potentially erosive high flows and maintain the low flow to the basin center, away from its current course along the south slope toe. Approximately 7.56 acres of vegetated waters would be temporarily impacted by the proposed project. Approximately 4.8 acres of mixed riparian would be planted, another 9 acres would be managed for recruitment with some additional planting on site in compensation for that temporary loss of about half of the existing riparian vegetation. Post-project basin conditions will include about 7.5 acres of the existing riparian habitat and additional acres of plantings which should continue to support endangered Least Bell's Vireos, *Vireo bellii pusillus* that historically nest in the basin and environs.

Project Analysis

Literature Review

The biological assessment was prepared by the OCWD Natural Resource Department in October 2019. To identify sensitive species, the most recent records of the California Department of Fish and Wildlife Natural Diversity Database, the California Native Plant Society Online Listing of Rare and Endangered Plants, and the U.S. Fish and Wildlife Service Information for Planning and Consultation were referenced.

Vegetation Community Mapping

Vegetation community mapping was conducted during the 2017-2019 field seasons by walking the project site and comparing aerial photographs. Data collected was digitalized through GIS software to illustrate vegetation communities occurring on the project site.

Wildlife and Plant Surveys

OCWD biologists routinely conduct wildlife surveys in the project site to monitor and note listed and sensitive species. Annual surveys are conducted at least 8 times per year, the results of which are incorporated in this assessment.

PROJECT DESCRIPTION

Background

The Action Area is located within Orange County on Santiago Creek. The Action Area is further defined as all those areas that would be directly or indirectly affected by the proposed action in the Smith Basin Improvement Project description but largely confined to the limits of grading for the project.

Smith Basin is an existing OCWD groundwater management basin located on the north side of Villa Park Road, between Lemon Street and Santiago Boulevard, City of Orange, Orange County, California (Figure 1). Smith Basin is part of OCWD's Santiago Basin complex of groundwater management basins, which also includes Bond and Blue Diamond Basins. The basin is roughly triangular and is bordered on the north and west by single family residential uses, on the east by Oak Ridge Private School and North Santiago Boulevard, and on the south by Villa Park Road and Blue Diamond and Bond Basins. Open slopes down from these adjacent uses to the basin bottom vary from 125 – 175 feet wide. Santiago Creek flows into the basin and meanders along the southern slope before emptying into Blue Diamond Basin through a 21-foot diameter corrugated metal pipe under Villa Park Road.

Prior to operating as a groundwater management basin, Smith Basin was a quarry pit. Quarry operations began in the early 1950's and progressed into the 1980's. In 1959, an active quarry pit was operating in the location of the Oak Ridge Private School. In 1970 Villa Park Road was constructed and Smith Basin was connected to Blue Diamond Pit through a culvert beneath the roadway.

In the early 1990's the Santiago Basins were purchased by the Orange County Water District and incorporated into the groundwater management system. Subsequently, the Burris Basin Pump Station and Santiago Pipeline were constructed, allowing Santa Ana River water stored in Burris Basin to be pumped into the Santiago Basins for groundwater recharge. In 2003, OCWD completed construction of the Santiago Basin Pump Station which allowed water to be pumped back into Burris Basin. This created operational flexibility for faster drawdown of the Santiago Basins to free up storage for storm water capture, when needed and to increase recharge in Santiago Creek. During average rainfall conditions, the District captures and recharges an estimated 50,000 to 70,000-acre feet of creek stormflow, most of it stored in the Santiago Basins.

Figure 1: Smith Basin Improvement Project Vicinity Map



Smith Basin Setting

The Smith Basin embankment slopes vary from 50 feet to 80 feet in height and from approximately 1:1 to 2:1 in slope ratio; near the southwest corner of the basin, the embankment slope is approximately 1:1. A portion of the north embankment slope has been improved with concrete v-ditch drainage. A maintenance road is present along the top of the eastern embankment slope and along the eastern portion of the southern embankment slope. Portions of the basin interior and lower areas of the southern and eastern embankment slopes are covered with dense vegetation. Portions of the southern and eastern embankment slopes have experienced heavy erosion, largely from major flood events.

In September of 2015, Ninyo & Moore Geotechnical Consultants prepared a scour assessment of Smith Basin to document the extent of the erosion and the potential water sources causing the erosion. Three areas were identified that have experienced significant erosion (Figure 2). The improvements proposed to these areas would significantly curtail further erosion.

Area 1

Area 1 is located on the southern embankment slope adjacent to Villa Park Road (Figure 2); here an approximate 450-foot long area along the toe of the embankment slope has been progressively eroding during high water flow events since approximately 1981. The erosion has created a near-vertical scarp that is approximately 25 feet high. Some eroded talus is present near the base of the scarp, but most of the eroded material has been transported downstream. The primary cause of erosion to Area 1 would be undercutting of the toe of the embankment slopes from the southerly migration of Santiago Creek. Since approximately 1978, the flow line of Santiago Creek has been progressively migrating to the south resulting in erosive waters flowing against the base of the eastern and southern embankment slopes during high flow events. The primary concern for this severe erosion is the proximity to Villa Park Road. Without the project, future erosion is anticipated during significant rainfall and highwater flow events.

Area 2

Area 2 is located on the eastern embankment slope which is adjacent to Oak Ridge Private School and the northern end of North Santiago Boulevard. The area of erosion is approximately 700 feet long along the toe of the embankment slope; it has been progressively eroding during flood events. This has created a near-vertical scarp that reaches a height of about 65 feet at the northeast end. Most of the eroded material has been transported downstream. As with Area 1, the primary cause of erosion to Area 2 has been undercutting of the toe of the embankment slope. The severity of the erosion raises concerns for the Oak Ridge Private School which is proximal. Future erosion is anticipated during significant rainfall and highwater flow events if the project is not constructed.

Figure 2: Smith Basin Improvement Project Limits

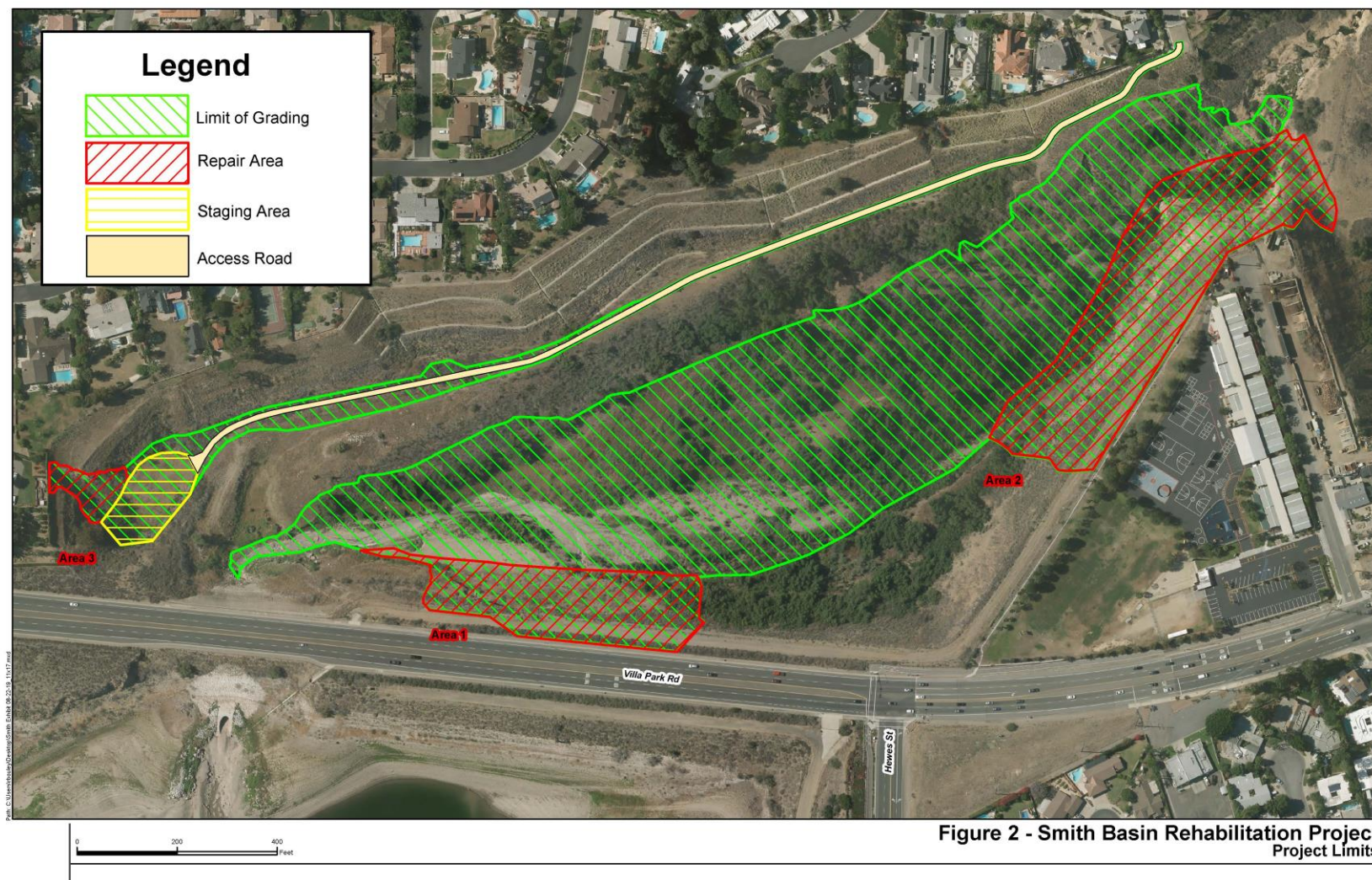


Figure 2 - Smith Basin Rehabilitation Project
Project Limits

Area 3

Area 3 is located near the top of the embankment slope near the west corner of the basin. Over the years an erosion-caused gully has widened and retreated to the west toward the adjacent residential property. The erosion gully is steep-sided and 6 feet to 10 feet deep. The primary cause of erosion in Area 3 is uncontrolled surface water flow against the embankment slope. Concerns in Area 3 are the continued widening of the erosion gulley and its continued westward retreat.

Project Activities

The proposed project involves geotechnical improvements to areas in Smith Basin that have experienced substantial erosion on the basin slopes. Smith Basin would be repaired and/or improved to increase geotechnical stability. As part of the improvements half of the bottom of Smith Basin will be re-graded to repair the existing slope damage and re-establish Santiago Creek to its former alignment.

The project consists of repairs to three main areas and moving the low flow channel to its former centerline location. Relocating the creek would help to prevent future damage to the slopes from erosion caused by flow against the base of the south slope. Soil would be excavated from the bottom of Smith Basin and placed on the damaged slopes to restore them to a more stable grade.

The repair of the failed slopes in Smith Basin will require excavation along the base of the failures and placement of engineered fill. Existing fill excavated from within the bottom of Smith Basin would be used to repair the slopes. During execution of the work, equipment would be staged in a barren, upland area near the northwestern quadrant of Smith Basin.

Repair Slopes and Re-establish Alignment of Santiago Creek

The primary cause of erosion in Smith Basin is undercutting of the toe of the embankment from the southerly migration of Santiago Creek. Existing topography in the Basin indicates that the Santiago Creek bed is well defined and incised as it enters through the northeast corner of Smith basin. The basin consists of a long narrow vegetated shelf along the north side of the basin that was historically used as an access road when the basin was part of a gravel quarry. A long, wide, relatively flat lowland courses through the middle and southern areas of the basin. Over time, the creek flow has moved from the northern side of the basin towards the south to its current alignment along the toe of the southern and eastern slopes. Flows in Santiago Creek are highly variable throughout the year, with the highest flows typically occurring during the rainy season (November – April) with low flows during the remainder of the year. In addition, during the rainy season when the downstream Santiago Basins are full, water is impounded in Smith Basin, covering approximately two-thirds of the bottom of the basin.

The creek currently flows in a shallow incision near the base of the failed slopes at the southern and eastern edges of the basin.

Re-establishing these embankment slopes would require the current low-flow path of Santiago Creek to be moved northward and westward back towards its former location. Since the soil to repair the slopes would be excavated from the bottom of the basin, construction in the basin would be completed in one phase. The repair work includes re-establishing the historical access road on the north, re-grading the bottom of Smith Basin to restore Santiago Creek in its former alignment nearer the middle of the basin; repairing and reconstructing the slopes in the basin; and constructing groins to slow water flow along the southern slope. The embankments, groins, and slopes would all be left suitable for establishing native plants after construction.

Approximately one-half of the existing vegetation in the bottom of Smith Basin will be removed to complete the slope repairs and creek alignment restoration. In order to access Smith Basin with the equipment to complete this work, the historic access road along the toe of the northern slope of the basin would be restored and graded to its original condition. This road will become the main access into and out of the bottom of Smith Basin. The bottom of the basin would be graded to restore Santiago Creek to its historic flow path along the middle of the basin, in a southwesterly direction from the northeast corner of the basin to the outlet at the culvert under Villa Park Road in the southwest corner of the basin. Smith Basin will include a shelf that extends from the inlet to approximately 700 feet downstream of the inlet. The basin grade will drop approximately fifteen feet downstream of this shelf into the remainder of the basin. This shelf would be constructed across the basin with groins and ponds on either side of the drop to slow the creek velocity in the basin and prevent erosion.

Reconstruction of the slopes in Smith Basin would be completed using soil excavated from the bottom and sides of the Basin. First the eroded slump blocks would be removed, and a fill keyway that extends through the footprint of the slope fill would be excavated. These keyways would be filled, and the slope reconstruction would continue from the bottom of the basin and proceed upwards to the top. Engineered fill would be placed in layers to construct the buttress fill and reconstruct the slope up to the existing top of the slope. Reconstruction activities would extend approximately 40 feet beyond both ends of the existing eroded areas.

The realigned creek low-flow channel would be constructed with a width of approximately fifteen feet and depth of two feet. The creek regrading would be completed concurrent with the excavation of the slope repairs. Approximately 200,000 cubic yards of soil would be excavated within Smith Basin to re-grade the creek alignment and repair the slopes. The high flow creek channel would include the whole width of Smith Basin. Groins would be constructed perpendicular to the slope along the south side of the basin to slow the creek velocity in the basin during high flow events and slow future erosion.

BIOLOGICAL RESOURCE EVALUATION

The Santiago Basins including Smith Basin are located within the Santa Ana River (SAR) watershed. The SAR watershed encompasses over 2,650 square miles and includes portions of San Bernardino, Riverside, and Orange Counties. The primary waterway in the watershed is the SAR which extends over 100 miles and drains about 50 tributaries. The headwaters of the SAR and tributaries originate in the San Gabriel and San Bernardino Mountains to the north, the San Gorgonio and San Jacinto Mountains to the east, and the Santa Ana Mountains in Orange County. On the far north the river drains southwest into the Prado Dam Basin, where it is impounded for flood control and water conservation purposes. The impounded water at the dam is released to downstream segments of the SAR, where it is used to help replenish the Orange County Groundwater Basin.

Smith Basin is a water retention basin with California coastal sage scrub habitat on steep slopes and upland shelves, and riparian habitat supported by a creek with perennial low flow and seasonal flood water. Santiago Creek flows into the basin and meanders along the southern slope. The creek in low flow mostly stays in a defined channel with minor braiding or sheet flow in a small part of the basin. A riparian corridor exists along the full length of the creek and at intervals on the basin floor. During the rainy season the basin stays flooded, the pool height dependent upon the adjacent, connected and much larger pool in the Santiago Basins just downstream. This pool provides enough seasonal water to sustain various pockets of Riparian habitat throughout the entirety of Smith Basin while excluding xeric species. Because of the prolonged seasonal inundation, much of the basin floor consists of bare ground. The basin slopes are covered in coastal sage scrub and/or weeds. The north slope is a mixture of non-native weedy species with scattered patches of degraded California coastal sage plantings while the south slope primarily consists of dominant California coastal sage with only sparse non-native weedy growth.

North Slope

The north slope of Smith Basin consists of a wide, weed-abated fire break below the residential community, a combination of non-native weedy species' and elements of California coastal sage scrub make up the bottom half of the slope. The two primary non-native species' present in this area are African Fountain Grass (*Pennisetum setaceum*), and Black Mustard (*Brassica Nigra*). The coastal sage patches are locally abundant but not found over the entire northern slope area. The coastal sage components on this slope consist primarily of California Buckwheat (*Eriogonum fasciculatum*), Bush Sunflower (*Encelia californica*), and Scale-broom (*Lepidospartum squamatum*). The scrub is highly degraded on this slope and heavily mixed with non-native plants. The bottom of the slope ends at an old access road that contains some Mulefat (*Baccharis salicifolia*) cover.

South Slope

The south slope of Smith Basin contains healthy, yet highly monotypic stands of California Coastal Sage dominated heavily by Bush Sunflower. Roughly half of the slopes on the south side of the basin have eroded into the basin, leaving steep slopes with a narrow, spindly habitat belt. A few Black Willows (*Salix goodingii*) have encroached up the slope below the coastal sage bands. Black Mustard (*Brassica nigra*) and Tocalate (*Centaurea melitensis*) are found intermixed with the coastal sage, taking up any bare ground on the slope.

Basin Bottom

Conditions for understory species in the basin bottom are extreme due to the retention of a deep inundation pool during the wet season. The pool will often linger long into the spring making it difficult for most species to recruit, except Cockerbur (*Xanthium stumarium*). As the water recedes the area quickly turns xeric often stunting any recruited plants. Due to these conditions much of the basin floor consists of bare ground. Bands of Black Willow (*Salix goodingii*) grow in certain parts of the bottom indicating changing creek routes over the years, and highwater marks. Tamarisk (*Tamarix ramosissima*) is found amongst the Willows and makes up the primary non-native species on the basin floor. Cockerbur is the primary understory species on the bottom. The Cockerbur is mostly stunted due to the harsh conditions.

Santiago Creek

Most of the riparian growth occurs in the upper part of the creek (east side of basin) where there is perennial flow from the creek and more moderate inundation during the winter. Diverse understory species reside in and along the upstream creek bed. The creek descends through a narrow canyon at the upstream mouth of the basin. From here the creek winds through the basin along the south slope and becomes braided with several smaller channels converging into wider, slow moving pools. As the creek approaches the southeast corner of the basin, it joins into a single defined channel and exits the basin.

The primary riparian species along the creek is Black Willow (*Salix goodingii*). This species is seen along the eastern half of the creek but tends to be absent through much of the western stretch as the creek travels through the primary inundation zone. The understory varies greatly as the creek travels from east to west including Willow Weed (*Polygonum lapathifolium*), Cockerbur (*Xanthium stumarium*), and Spanish Sunflower (*Pulicaria paludosa*). Watercress (*Nasturtium officinale*) becomes more abundant as the creek enters the inundation zone. This zone offers more sunlight due to the loss of tree canopy.

Vegetation Communities/Land Cover

The project site contains a diversity of vegetation and land covers (Figure 3; Table 1). For mapping purposes similar vegetation types were grouped together under one classification. The vegetation classifications identified within the project area includes willow, mixed riparian, coastal sage scrub, and mixed-coastal sage scrub. The remainder of the project site contains disturbed area, bare ground and the creek itself.

Willow

The Willow community is dominated by Black Willows. This community is predominately located in the inundation zone where most other species cannot thrive. There is very little understory in this zone and more bare ground than willow riparian.

Mixed Riparian

The Mixed Riparian classification consists of a mixture of native and non-native riparian vegetation. Riparian Mixed vegetation on the project site consists of Black Willow, Mulefat, Cocklebur, Willow Weed (*Polygonum lapathifolium*), Tall Umbrella Sedge (*Cyperus eragrostis*), Watercress, False Daisy (*Eclipta prostrata*), Mexican Spangletop (*leptochloa uninervia*), California bulrush (*Scirpus californicus*), Common Cattail (*Typha latifolia*), Chinese Purslane (*Heliotropium curassavicum*), Tamarisk, Castor Bean (*Ricinus communis*), Flowering Tobacco (*nicotiana glauca*), Valley red-Stem (*Ammannia coccinea*), and White Sweetclover (*Melilotus albus*).

Coastal Sage Scrub

Coastal Sage Scrub in the project area consist predominately of California sagebrush (*Artemisia californica*), California bush sunflower, and California buckwheat (*Erigonum fasciculatum*).

Mixed Coastal Sage Scrub/Non-native Grasses/Weeds

Mixed Coastal Sage Scrub/Non-Native/Weeds consists of coastal sage scrub and non-native, exotic species. This vegetation community in the project area consists of a mix of California sagebrush, California bush sunflower, California buckwheat, Black Mustard, Tocalote, Mexican Tea (*Disphania ambrosiodes*), Johnson Grass (*Sorghum halepense*) and African Fountain Grass.

Disturbed Area

Disturbed lands in the project area are those with the most consistent perturbations due to human presence and activities. Disturbed areas or clearings in the project area are characterized by compacted, frequently disturbed soils.

Figure 3: Smith Basin Improvement Project Existing Vegetation



Table 1: Vegetation Communities

Vegetation Community	Acreage
Willow	0.7
Mixed Riparian	13.56
Coastal Sage Scrub	2.93
Mixed Coastal Sage Scrub/Non-native Weeds	3.46
Santiago Creek	0.57
Non-native Weeds	7.94
Bare Ground	7.71
Disturbed	2.43
Total	39.3

Special Status Species

Plant Species

A database search of special status plant species listed in the California Native Plant Society Online Survey of Rare Plants, U.S. Department of Interior Information Planning and Conservation System Database and the California Department of Fish and Wildlife Natural Diversity Data Base for the Orange U.S.G.S. Quadrangle was conducted to determine the potential for special status plant species to occur on the project site. The determination on the potential occurrence of the species was based on the following criteria:

Present: The species is commonly observed, or trace signs of the species were observed within the study area within the last year.

High: The study area supports suitable habitat and the species has been observed within the last 2 years and within 2 miles of the study area.

Moderate: The study area supports suitable habitat.

Low: The study area lacks suitable habitat.

No Federal or State listed plant species was identified as having moderate or higher potential to occur within the study area (Table 2).

Table 2: Special Status Plant Species

Species	Federal	State	CNPS	General Habitat Requirements	Project Site Habitat Suitability	Potential Occurrence on Project Site
Santa Ana River Woollystar (<i>Eriastrum densifolium</i> ssp. <i>Sanctorum</i>)	E	E	1B.1	Sandy gravelly Soils on River Floodplain. Flowering period May to September.	Project site lacks suitable habitat for the species.	Low Potential. Species believed to be extirpated in Orange County.
Gambel's Watercress (<i>nasturtium Gambelii</i>)	E	E	1B.1	Brackish Marsh, Freshwater Marsh and Swamp Wetland.	Project site lacks suitable habitat for the species.	Low Potential.
Legend Federal E- Endangered T-Threatened NL-Not Listed State E-Endangered T-Threatened NL-Not Listed			California Native Plant Society CNPS 1A-Plants presumed extinct in California 1B- Plants rare, threatened, or endangered in California and elsewhere 2-Plants rare, threatened, or endangered in California but more common elsewhere 3-Plants about which we need more review 4-Plants of limited distribution CNPS Threat Rank .1 Seriously Endangered .2 Fairly Endangered .3 Not Very Endangered			

Wildlife Species

A review of the U.S. Department of Interior Information Planning and Conservation System Database and California Department of Fish and Wildlife California Diversity Data Base for the Orange USGS Quadrangle was conducted to determine the potential for special status wildlife species to occur within the study area. A complete listing of sensitive wildlife species identified within the quadrangle area and the potential for the species to occur on the project site is shown in Table 3. The determination of the potential for the species to occur within the study area was based on the following criteria.

Present: The species is commonly observed, or trace signs of the species were observed within the study area within the last year.

High: The study area supports suitable habitat and the species has been observed within the last 2 years and within 2 miles of the study area.

Moderate: The project area supports suitable habitat.

Low: The study area lacks suitable habitat.

Table 3: Special Status Wildlife Species

Taxonomic Group	Federal Listing	State Listing	State Ranking	General Habitat Requirements	Project Site Habitat Suitability	Potential Occurrence on Project Site
Reptiles						
Orange-throated whiptail (<i>Aspidoscelis hyperythra</i>)	NL	SSC	S2, S3	Low level Coastal Sage Scrub, Chaparral, Grass, Oak Woodland. Prefers washes, sandy areas with patches, brush.	Project site supports suitable habitat for the species. Species has not been observed within last 2 years.	Moderate Potential.
Coast horned lizard (<i>Phrynosoma blainvillii</i>)	NL	SSC	S3, S4	Most common in lowlands along sandy washes with scattered low brushes, requires open areas for sunning, bushes for cover and abundant supply of ants and other food sources.	Project site lacks suitable habitat for the species.	Low Potential.
Birds						
Cooper's hawk (<i>Accipiter cooperii</i>)	NL	NL	S4	Woodlands, nest sites mainly in riparian growths of deciduous trees.	Project site supports suitable habitat for the species. Species is commonly observed on the project site within last year.	Present.
Tricolored blackbird (<i>Agelaius tricolor</i>)	NL	E	S1, S2	Wetlands, Agricultural Fields.	Project site lacks suitable habitat for the species.	Low Potential.
Southern California rufous crowned sparrow (<i>Aimophila ruficeps canescens</i>)	NL	NL	S3	Chaparral Cismontane Coastal Scrub	Project site supports suitable habitat for the species. Species has not been observed here within last two	Moderate Potential.

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					years.	
Coastal Cactus Wren (<i>Campylorhynchus brunneicapillus sandiegenis</i>)	NL	NL	S3	Coastal Scrub.	Site does not contain tall opuntia or cholla cactus habitat	Low Potential.
Western yellow billed cuckoo (<i>Coccyzus americanus occidentalis</i>)	T	E		Species typically require a minimum of 25 acres of area and forage predominantly in cottonwood tree stands.	Suitable riparian habitat is sparse. Species has not been seen within last 10 years and is believed to be extirpated in Orange County.	Low Potential.
White-tailed kite (<i>Elanus leucurus</i>)	NL	NL	S3, S4	Woodland, Marsh, Swamp Riparian Woodland, valley and Foothill,	Project site supports suitable habitat for the species. Species has not been observed within last two years.	Moderate Potential.
Yellow breasted chat (<i>Icteria virens</i>)	NL	NL	S3	Summer resident, inhabits riparian thicket of willow and other brushy thickets near water courses, nests in low dense riparian vegetation.	Project site supports suitable habitat for the species. Species has not been observed within last 2 years.	High Potential.
Laterallus jamaicensis coturniculus (<i>California black rail</i>)	NL	Threatened	S1	Brackish Marsh, Freshwater Marsh & Swamp, Slt marsh Wetland	Project site lacks suitable habitat for the species.	Low Potential.
Coastal California gnatcatcher (<i>Poliopitila californica</i>)	T	SSC		Permanent resident of coastal sage scrub, low scrub, in arid washes, on mesas and slopes.	Project site supports suitable habitat for the species. Species is commonly observed on the project	Present

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					site within the last year	
Setophaga petechia (Yellow Warbler)	NL	NL	S3, S4,	Summer resident, inhabits riparian thicket of willow and other brushy thickets near water courses, nests in low dense riparian vegetation.	Project site supports suitable habitat for the species. Species has not been observed within last 2 years.	High Potential.
Least Bell's vireo (Vireo bellii pusillus)	E	E		Summer resident of southern California in low riparian habitats in vicinity of water or dry river bottoms, nests placed along margins of bushes or on twigs landing on pathways, usually willow, mesquite or mulefat.	Project site supports suitable habitat for the species. Species is commonly observed on the project site within the last year.	Present.
Aquatics						
Santa Ana sucker (Catostomus santaanae)	T	SSC		Cool, Clear Streams, Rivers, rocky Bottom in riparian woodlands.	Project site lacks suitable habitat for the species	Low Potential.
Federal Listing E-Endangered T-Threatened SSC-Species of Special Concern NL-Not Listed			State Listing E-Endangered T-Threatened NL-Not Listed		State Ranking S1-Critically Imperiled S2-Imperiled S3-Vulnerable S4 Apparently Secure S5-Secure	

Critical Habitat

The project site is not located on lands that are designated as Critical Habitat.

Migratory Birds

A review of the U.S. Department of Interior Information Planning and Conservation System Database was conducted to determine the potential for migratory birds to occur within the study area. A complete listing of sensitive wildlife species identified within the quadrangle area and the potential for the species to occur on the project site is shown in Table 4. The determination of the potential for the species to occur within the study area was based on the following criteria.

Present: The species is commonly observed, or trace signs of the species were observed within the study area within the last year.

High: The study area supports suitable habitat and the species has been observed within the last 2 years and within 2 miles of the study area.

Moderate: The project area supports suitable habitat.

Low: The study area lacks suitable habitat.

Table 4: Migratory Birds

Species	Federal Listing	State Listing	State Ranking	General Habitat Requirements	Project Site Habitat Suitability	Potential Occurrence on Project Site
Allen's Hummingbird (Selasphorus sasin)	NL	NL	NL	Riparian woodlands	Project site supports suitable habitat. Species commonly reported.	Present.
Bald Eagle (Haliaeetus leucocephalus)	NL	E	S3	Lower montane coniferous forest, Old growth	Project site lacks suitable habitat for the species.	Low.
Black Skimmer (Rynchops niger)	NL	NL	S3	Sandy shoreline	Project site lacks suitable habitat for the species	Low.
Black-chinned Sparrow (Spizella atrogularis)	NL	NL	NL	Arid chaparral, arid rocky hillsides with scattered scrub oak or juniper	Project site lacks suitable habitat for the species	Low.
California Thrasher (Toxostoma redivivum)	NL	NL	NL	Chaparral in coastal and foothills areas and wooded thickets near water	Project site supports suitable habitat. Species commonly reported.	Present.
Clarkes Grebe (Aechmophorus clarkia)	NL	NL	NL	Winters on lakes and along southern Pacific coast	Project site lacks suitable habitat for the species	Low.
Common Yellowthroat (Geothlypis trichas sinuosa)	NL	NL	S3, Species of Special Concern	Marsh & Swamp	Project site supports suitable habitat. Species commonly reported.	Present.
Costa's Humming Bird	NL	NL	S4		Project site supports	Moderate

Biological Resource Evaluation

(<i>Calypste costae</i>)					suitable habitat for the species. Species has not been observed within last two years.	
Golden Eagle (<i>Aquila chrysaetos</i>)	NL	NL	S4	Upland forest, Cismontane Woodland, Coastal Prairie	Project site lacks suitable habitat for the species	Low.
Lawrence's Goldfinch (<i>Carduelis lawrencei</i>)	NL	NL	NL	Arid woodlands, chaparral and brushy areas.	Project site supports suitable habitat for the species. Species has not been observed within last two years.	Moderate.
Long Billed Curlew (<i>Numenius americanus</i>)	NL	NL	S2	Grassland, Meadow & seep	Project site lacks suitable habitat for the species	Low.
Marbled Godwit (<i>Limosa fedoa</i>)	NL	NL	NL	Coastal bays, marshes, tidal mudflats	Project site lacks suitable habitat for the species	Low.
Nuttall's Woodpecker (<i>Picoides nuttallii</i>)	NL	NL	NL	Chaparral with scattered trees and riparian areas	Project site supports suitable habitat. Species commonly reported.	Present.
Oak Titmouse (<i>Baeolophus inornatus</i>)	NL	NL	S4	Riparian areas and wooded habitats	Project site supports suitable habitat. Species commonly reported.	Present.
Rufous Hummingbird (<i>Selasphorus rufus</i>)	NL	NL	S1, S2	Woodland areas near streams	Project site supports suitable habitat for the species. Species has not been observed	Moderate.

Biological Resource Evaluation

					within last two years.	
Short-billed Dowitcher (<i>Limnodromus griseus</i>)	NL	NL	NL	Salt marshes and mud flats	Project site lacks suitable habitat for the species	Low.
Song Sparrow (<i>Melospiza melodía</i>)	NL	NL	S3, Species of Special Concern	Brushy areas	Project site supports suitable habitat. Species commonly reported.	Present.
Spotted Towhee (<i>Pipilo maculatus clementae</i>)	NL	NL	S1, S2	Chaparral, Riparian Scrub	Project site supports suitable habitat. Species commonly reported.	Present.
Whimbrel (<i>Numenius phaeopus</i>)	NL	NL	NL	Coastal marshes and flats	Project site lacks suitable habitat for the species	Low.
Willet (<i>Tringa semipalmata</i>)	NL	NL	NL	Ocean coasts	Project site lacks suitable habitat for the species	Low.
Federal Listing E-Endangered T-Threatened NL-Not Listed			State Listing E-Endangered T-Threatened NL-Not Listed		State Ranking S1-Critically Imperiled S2-Imperiled S3-Vulnerable S4 Apparently Secure S5-Secure	

Wildlife Movement Corridors

Wildlife/Corridors and linkages that facilitate regional wildlife movement are generally centered around water ways, ridgelines, riparian corridors, flood control channels, contiguous habitat and upland habitat. Different types of wildlife movement corridors provide specific types of functions pending on the landscape of the area and habitat conditions.

- Movement corridors are physical connections that allow wildlife to move between patches of suitable habitat.
- Dispersal corridors are relatively narrow, linear features embedded in a dissimilar matrix that links two or more areas of suitable habitat that would otherwise be fragmented and isolated from one another by rugged terrain, changes in vegetation or human-altered environments.

- Habitat linkages are broader connections between two or more habitat areas.
- Travel routes are usually landscape feature, such as ridgelines, drainages, canyons or riparian corridors within larger natural habitat areas that are used frequently by animals to facilitate movement and provide access to water, food, cover, den sites or other necessary resources.
- Wildlife crossings are small, narrow areas of limited extent that allow wildlife to pass an obstacle or barrier. Crossings typically are manmade and include culverts, underpasses, drainage pipes, bridges and tunnels to provide access past roads, highways, pipelines or other physical obstacles.

Santiago Creek provides wildlife movement from the Santa Ana Mountains to the Santiago Basins including Smith Basin. From these basins the creek continues downstream to where it joins the Santa Ana River at the Riverview Golf Course. Between Santiago Basin and the Riverview Golf Course, Santiago Creek meanders through patches of open space that provides habitat for some wildlife. However, downstream of the golf course there are limited amounts of open space and the Santa Ana River transitions into a lined flood control channel with limited habitat and access and its ability to function as a wildlife corridor is severely diminished.

Other than temporary diurnal grading activity, the Smith Basin Rehabilitation project will not result in a physical obstacle or otherwise impede wildlife movement.

JURISDICTIONAL RESOURCES

Waters of the U.S.

According to the Federal Clean Water Act, any activity that involves the discharge of dredged or fill material into Waters of the United States is subject to approval of 404 Permit from the U.S. Army Corps of Engineers (Corps). A water body is considered Waters of the United States if it is: (1) traditional navigable water (TNW), (2) wetlands adjacent to a TNW, (3) non-navigable tributaries of TNW that have perennial or seasonal flow of water, and (4) wetlands that are adjacent to non-navigable tributaries of TNW that have perennial or seasonal flow of water. The US Waters jurisdiction extends to the ordinary high-water mark and adjacent wetland vegetation.

Waters of the State of California

According to the State Water Code, Waters of the State are defined as any surface water, groundwater or wetlands within the boundary of the State. Generally, the States Waters jurisdiction extends to the top of the slope of a drainage course and adjacent wetland vegetation.

Wetland Waters of the United States and State California

Wetland Waters are a subset of jurisdictional Waters of the U.S. and the State. Generally, wetlands are lands where saturation with water is the dominant factor determining the nature of soil development and the types of plant and animal communities living in the soil and on its surface. Presently, there is no single definition of wetlands recognized by the state and the federal government.

However, the state and federal definitions do share common terms and concepts. For purposes of this classification, wetlands must have one or more of the following three attributes: (1) at least periodically; the land supports hydrophytes; (2) the substrate is predominantly undrained hydric soil; and (3) the substrate is non-soil and is saturated with water or covered by shallow water at some time during the growing season of each year. Wetlands generally include swamps, freshwater, brackish water and saltwater marshes, bogs, vernal pools, periodically inundated salt flats, intertidal mudflats, wet meadows, wet pastures, springs and seeps, portions of lakes, ponds, rivers and streams and all areas which are periodically or permanently covered by shallow water, or dominated by hydrophytic vegetation, or in which the soils are predominantly hydric in nature.

Smith Basin Waters of U.S./State Determination

The closest traditional navigable water to the project site is the Pacific Ocean. The Santiago Creek which traverses through Smith Basin is considered a non-navigable water tributary to the Santa Ana River which in turn is a tributary to the Pacific Ocean. Santiago Creek consists of seasonal and perennial flows that in some cases will

ultimately drain into the Pacific Ocean. Because Smith Basin essentially functions as a conduit to navigable water it is considered Waters of the U.S. Additionally, Smith Basin meets the State Water Code definition of a water body and is classified as Waters of the State. Table 5 provides a calculation of the areas within the project footprint that consist of Waters of the US/State and Wetland Waters of the US/State. Figure 4 illustrates the locations of waters and wetland waters of the US/State.

Table 5: Waters/Wetland Waters of US and State

Site	Waters US/State (Acre)	Wetland Waters US/State (Acre)
Smith Basin Rehabilitation Site	.57	7.56

BIOLOGICAL IMPACTS

The following threshold of significance was used to evaluate potential impacts to biological resources associated with implementation of the Smith Basin Project.

IMPACT BIO-1: Will the project have a substantial adverse impact, either directly or through habitat modifications, on any species identified as a candidate, sensitive or special status species in local or regional plans, policies or regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Services?

Sensitive Plant Species

A search of CDFW California Natural Diversity Database and California Native Plant Society Database in conjunction with site reconnaissance of the project area has determined that there would be low potential for sensitive plant species to occur on the project site. Therefore, implementation of the Project would not result in adverse impacts to sensitive plant species.

Sensitive Wildlife Species

Least Bell's vireo

The vireo is a listed Federal and State Endangered Species. The vireo is a small migratory songbird that historically was common in lowland riparian habitat, ranging from coastal southern California through Sacramento and San Joaquin Valleys with scattered populations in Coast Ranges of the Sierra Nevada, Mojave Desert and Death Valley. Presently, the species only occurs in riparian woodlands in southern California. Surveys conducted in 2019 identified four vireo territories in the project vicinity including one territory within the project site (Figure 4).

The project will impact 7.56 acres of mixed riparian vegetation that provides marginal habitat value, which could result in a potentially significant impact to vireo. Conservation Measure BIO-1 has been identified that would avoid potential impacts to vireos by requiring vegetation removal activities to occur outside of the nesting season. Additionally, the project site would be required to be surveyed by a qualified biologist prior to vegetation removal activities to ensure no vireos are present. With the implementation of Conservation Measure BIO-1 potential adverse impacts would be avoided.

Coastal California Gnatcatcher, Southern California Rufous Crowned Sparrow

The California Gnatcatcher is a listed Federally Threatened species and State Species of Concern. The Southern California Rufous Crowned Sparrow is State Species of Concern. Both species inhabit and nest in areas that contain coastal sage scrub habitat. There are no known Rufous Crowned Sparrow territories on the project site.

The California Gnatcatcher is a year-round resident of scrub dominated plant communities from southern Ventura County southward through Los Angeles, Orange, San Bernardino, Riverside, and San Diego counties. There are historical gnatcatcher territories in Smith Basin, but as of 2019 territories were documented outside of the limits of grading. Figure 4 shows the California Gnatcatcher territories documented in Smith Basin in 2019.

The implementation of the project would temporarily disturb 1.3 acres of habitat that is marginally suitable for gnatcatchers. Although no gnatcatcher territories have been identified within the area of disturbance for the proposed project, measures have been identified to avoid potential direct impacts and indirect noise impacts. Conservation Measure BIO-1 would require that vegetation removal activities occur outside of nesting season. Additionally, prior to the removal of vegetation the project site would be surveyed by a qualified biologist. If the habitat is occupied, no vegetation removal activities would occur until such time as the habitat is no longer occupied. With the implementation of Conservation Measure BIO-1 potential direct impacts to Coastal California Gnatcatcher would be avoided.

Cooper's Hawk, White-Tailed Kite

Cooper's Hawk, and White-tailed Kite is a State Species of Concern. Both species have been observed flying above Smith Basin. Both species are known to occupy and nest in trees. However, no nesting sites have been observed in Smith Basin. Potential impacts to Cooper's Hawk and White-tailed Kite would be avoided through the implementation of Conservation Measures BIO-1 and BIO-2, which would require vegetation and tree removal activities would occur outside of nesting season to avoid impacts to occupied nests. Additionally, prior to removal of any tree from the project site, each tree would be inspected to confirm if unoccupied nests are present. If unoccupied nests are encountered, they would be relocated outside of the construction activity impact area. With the implementation of Conservation Measure BIO-1 and BIO-2 potential impacts to Cooper Hawks and White-Tailed Kites would be avoided.

Yellow-Breasted Chat, Yellow Warbler

Yellow-Breasted Chat and Yellow Warbler are both State Species' of Concern. Both species have been documented in Smith Basin but have not been reported in the last 2 years. Both species prefer moist habitats with high insect abundance. Their habitats include the edges of marshes and swamps, willow-lined streams, dense riparian thickets, and leafy bogs. Their breeding habitat is restricted to hardwood thickets near water, especially those with willow, alder, and cottonwood. Suitable breeding habitat for these two species are present on the site and will temporally be impacted by direct removal. As the species has not been documented in recent years it can be assumed that there will be no historical territories impacted, and also to avoid potential impacts vegetation removal activities would occur outside of the nesting season. Additionally,

the project site would be surveyed by a qualified biologist prior to vegetation removal activities to ensure sensitive species are present. With the implementation of Conservation Measure BIO-1 potential adverse impacts would be avoided.

Figure 4: Least Bell's Vireo and California Gnatcatcher Territories 2019



Figure 5: Smith Basin Improvement Project Waters of the US/State

Orange Throated Whiptail

The Orange Throated Whiptail is a State Species of Concern. Orange throated whiptail primarily occurs in coastal sage scrub and chaparral communities. Higher densities of the species are typically associated with floodplains and streamside terraces. They also have been reported in a variety of other vegetation types, including non-native grasslands, juniper woodland and oak woodland. The orange throated whiptail diet consists of small invertebrates, especially spiders, scorpions, centipedes, termites and small lizards. The species reproduction period is from June to July. The project site supports suitable habitat and the species is known to occur. However, the species has not been observed on the project site within the last two years and significant impacts are not expected.

IMPACT BIO-2: Would the project have a substantial adverse impact on any riparian habitat or natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

As shown in Table 6 implementation of the project would temporarily impact 2.65 acres of upland native vegetation, 2.43 acres of non-native upland vegetation, and 7.56 acres of mixed riparian/ willow vegetation. The native vegetation at the project site is considered a sensitive vegetation community and the permanent loss of it would be

considered a significant impact. The project would temporarily remove native vegetation from the project site as part of the grading activities to repair and stabilize the failed slopes. Once the slopes are repaired, they would be planted with native vegetation to minimize erosion, and to return to its pre-project state. The site would be managed by OCWD to prevent the reestablishment of non-native vegetation. Because the potential impacts to native vegetation would be temporary and the non-native vegetation removed from the project site would be replaced with native vegetation, the potential impacts to sensitive vegetation communities would be less than significant with the implementation of Conservations Measures BIO-3 and 4.

Table 6: Smith Basin Rehabilitation Project Vegetation Communities Impacted

Vegetation Community	Acreage
Willow/Mixed Riparian	7.56
Upland Native (Coastal Sage Scrub/ Mix)	2.65
Upland Non-Native	2.43
Open Water	.57
Bare Ground	7.18

IMPACT BIO-3: Will the project have a substantially adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act through direct removal, filling hydrological interruption, or other means?

A wetland assessment was conducted at the project site in accordance with the Regional Supplement to the U.S. Army Corps of Engineers Wetland Delineation Manual Arid Region West. As shown in Figure 2 the project site has been divided into 3 focal areas within a large area to encompass the limits of grading. A parameter approach was used to identify Waters of the U.S., State and wetland Waters of the U.S. and State. These three parameters include; (1) the presence of wetland vegetation, (2) the presence of wetland hydrology and (3) the presence of hydric soils.

- **Vegetation:** The project area contains 7.56 acres of mixed native and non-native riparian vegetation including Black Willow, Mulefat, Tamarisk, and Cocklebur. These riparian species are recognized as wetland plant indicators.
- **Hydrology:** The hydrology is from inundation from the lowering and rising of the water level in the Santiago Basin complex. Perennial flow from Santiago Creek also feeds Smith Basin. The periodic inundation of vegetation plus the presence of creek water indicates the presence of wetland hydrology.
- **Hydric Soils:** Santiago Basin largely consists of Metz Sandy Loam soil which is classified as hydric soil.

Table 7: Project Impacts Jurisdictional Areas of U.S./State

Temporary Impacts Waters of State	Permanent Impacts Waters of State	Temporary Impacts Wetland Waters of State	Permanent Impacts Wetland Waters of State	Temporary Impacts Waters of U.S.	Permanent Impacts Waters of U.S.	Temporary Impacts Wetland Waters of U.S.	Permanent Impacts Wetland Waters of U.S.
.57	0.0	7.56	0.0	.57	0.0	7.56	0.0

Waters of U.S./State

The implementation of the project would not result in the permanent loss of U.S./State (Table 7). The project would temporarily impact .57 acres of Waters of U.S./State. The impacts would occur from grading activities on the bottom and slopes of the project site. The project impacts to Waters of the U.S./State would be temporary because no permanent fill or structure would be built. Once the grading activity is completed the disturbed areas would be re-contoured to their pre-project condition to the highest extent possible. There would be no net loss of the Waters of the U.S./State.

Wetland Waters of U.S./State

The implementation of the project would not result in the permanent loss of wetland Waters of the U.S./State (Table 7). The Project would result in potentially significant temporary impacts to 7.56 acres of wetland Waters of the U.S./State which consists primarily of native wetland habitat. The impacts to wetland Waters of the U.S./State would occur from grading activities at the bottom of the basin (Figure 2). The project impacts to wetland Waters of the U.S./State would be temporary because no permanent fill or structure would be built that would prevent re-growth of the impacted wetland vegetation. Once the grading activities are completed OCWD would plant native riparian vegetation in the disturbed areas and would manage the area to prevent re-establishment of non-native vegetation. With the implementation of Conservation Measure BIO-4 there would be no net loss of wetland habitat and potential impacts would be reduced to a less than significant level.

IMPACT BIO-4: Will the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

The only wildlife movement corridor within the vicinity of the project site is Santiago Creek. Although the grading measures will include sections of the creek itself, no physical barrier will be constructed that could restrict the movement of native wildlife. Wildlife will be allowed to move freely through the project site. Additionally, the project activities would occur during the day and would not interfere with any wildlife movement

activity that occurs at night when most do. All vegetation removal activities would occur outside of the nesting season to avoid impacts to nesting migratory birds. With the implementation of Conservation Measures BIO-1 and BIO-2 potential impacts to wildlife movement and nesting migratory birds would be reduced to a less than significant level.

IMPACT BIO-5: Will the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

The project site is not subject to any local policies providing for the protection of biological resources. The project would comply with all federal and state policies providing for the protection of biological resources.

IMPACT BIO-6: Will the project be in conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

The project site is not located on lands that are included in a Habitat Conservation Plan or Natural Community Conservation Plan.

CONSERVATION MEASURES

BIO-1: Prior to the start of vegetation clearing activities, the OCWD Project Manager shall ensure that vegetation clearing, and ground disturbing activities occur outside of the migratory bird nesting season (March 1 to August 31). If avoidance of the nesting season is not feasible, then the OCWD Project Biologist shall conduct a nesting bird survey no greater than three (3) days prior to any vegetation clearance activities at the Project site. If active nests are identified during the nesting bird survey, the biologist shall establish suitable buffers around the nests (depending on the level of activity within the buffer and species detected), and the buffer areas shall be avoided by construction personnel until the biologist makes a determination that the nests are no longer occupied and that the juvenile birds can survive independently from the nests.

BIO-2: Prior to tree removal activities, specimen native trees that are planned for removal from the project site shall be inspected by the OCWD Project Biologist to determine if raptor nests are present. If nests are encountered, the nests shall either be relocated outside of the area of disturbance. If relocation is not feasible, the Project Biologist shall create a new substitute nesting site located outside of the construction activity impact area.

BIO-3: Immediately after reconfiguring the slope areas, OCWD shall hydro-seed and plant native vegetation on areas disturbed by the project and the Project Biologist and/or their designee shall manage the area to ensure that non-native vegetation does not re-establish. In total 4.2 acres of upland California Coastal Sage habitat shall be planted. See Figure 6 for location of upland mitigation planting.

BIO-4: Following the completion of grading activities, OCWD's Project Biologist shall plant riparian habitat at the edge of the ordinary high-water mark within the disturbance area. The Project Biologist shall manage the area to ensure that non-native vegetation does not re-establish. In total 4.8 acres of riparian habitat shall be planted within the Project site, and an additional 9.0 acres of bottom acres shall be managed to recruit using flood irrigation from annual inundation events and additional planting if needed per the determination of the Project Biologist. See Figure 6 for location of riparian mitigation planting.

WQ-1: OCWD shall actively implement Best Management Practices (BMPs) to prevent erosion and the discharge of sediment into downstream receiving water bodies. BMPs shall include stabilize construction entrance/exit, installation of fiber rolls, placement of sandbags at drainage inlets to storm drain system. BMPs shall be monitored daily and repaired if necessary, to ensure maximum erosion and sediment control.

WQ-2: Wind control BMPs shall be implemented to stabilize exposed surfaces and minimize activities that suspend or track dust particles. Such measures would include regular watering of exposed soils, suspending grading operations when winds exceed 25 miles per hour and limiting construction traffic on exposed surfaces to 15 miles per hour.

Figure 6: Smith Basin Improvement Project Mitigation Plan



WQ-3: Equipment Delivery and Storage procedures and practices shall be implemented to reduce or eliminate the discharge pollutants to the storm water system or water course. Such measures include; minimizing the storage of hazardous materials onsite, storing materials in designated areas, and installing primary and secondary containment measures around staged construction equipment.

WQ-5: Vehicle equipment fueling procedures and practices shall be implemented to prevent fuel spills and leaks and reduce or eliminate contamination of storm water. Procedures include; ensuring that all equipment operating within or adjacent to groundwater recharge facilities is maintained daily to prevent leaks, using off site facilities for equipment fueling, fueling in designated areas only, enclosing or covering stored fuel and implementation of spill controls.

WQ-6: Stockpile Management procedures shall be implemented to reduce or eliminate air and storm water pollution from stockpiles of soil. Stockpiles shall be a minimum of 50 feet away from concentrated flows of storm water and drainage courses. Stockpiles shall be protected by using temporary perimeter sediment barriers.

WQ-7: Solid waste management procedures shall be implemented to prevent or reduce the discharge of pollutants to storm water from solid or construction waste by providing designated waste collection areas and containers and arranging for regular disposal.

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