



APPENDIX E: BIOLOGICAL RESOURCES

SANTA ANA RIVER WATER RIGHT APPLICATIONS FOR SUPPLEMENTAL WATER SUPPLY DRAFT ENVIRONMENTAL IMPACT REPORT

October 2004



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E1: INTRODUCTION

This Biological Resources Technical Appendix contains materials designed to supplement the biological resources analysis contained in the main body of the EIR. This appendix is comprised of the following sections.

- Section E2 includes letter reports summarizing results of focused surveys for 4 endangered wildlife species.
- Section E3 contains a survey report summarizing focused surveys for rare, threatened, endangered, and sensitive plant species and vegetation conducted during 2003.
- Section E4 contains additional background information on key resources in the project region that supplements the information presented in EIR Section 3.3.
- Section E5 contains tabulated background information on rare, threatened, endangered, and sensitive species potentially found in the project region, including both listed and unlisted sensitive species. These were initially prepared as background for the EIR analysis. More detailed information was subsequently developed on species that were actually found in the project region and have the potential to be impacted by the project. This latter information is contained in section 3.3 of the EIR.
- Section E6 provides the estimated acreage of different plant communities contained within the anticipated disturbance corridors of different Project elements.
- Section E7 provides a summary and analysis of mitigation alternatives proposed to provide habitat renewal in areas affected by decreased overbank flooding.

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E2: FOCUSED SURVEY REPORTS AS SUBMITTED TO THE U.S. FISH AND WILDLIFE SERVICE, CARLSBAD FIELD OFFICE

Attached are the following four letter reports submitted to appropriate field office of the U.S. Fish and Wildlife Service.

1. Results of Focused Coastal California Gnatcatcher Surveys on the Santa Ana River Water Rights Application for Supplemental Water Supply Project Construction Sites, San Bernardino County, California.
2. Results of Focused Surveys for the Least Bell's Vireo on the Santa Ana River Water Rights Application for Supplemental Water Supply Project Construction Sites, San Bernardino County, California.
3. Results of Focused Surveys for the Southwestern Willow Flycatcher on the Santa Ana River Water Rights Application for Supplemental Water Supply Project Construction Sites, San Bernardino County, California.
4. Results of Focused San Bernardino kangaroo rat (*Dipodomys merriami parvus*) (SBKR) Surveys on the Santa Ana River Water Rights Application for Supplemental Water Supply Project Construction Sites, San Bernardino County, California.



Science Applications International Corporation
An Employee-Owned Company

December 29, 2003

Mr. Daniel Marquez
U.S. Fish and Wildlife Service
Carlsbad Field Office
6010 Hidden Valley Road
Carlsbad, CA 92009

Re: Results of Focused Coastal California Gnatcatcher Surveys on the Santa Ana River Water Right Application for Supplemental Water Supply Project Construction Sites, San Bernardino County, California

Dear Mr. Marquez:

This letter report is prepared in compliance with the conditions of authorized permits issued under Section 10(a)(1)(A) of the Federal Endangered Species Act to Science Applications International Corporation (SAIC) biologist Marc Blain (Permit No. TE001075-1) for the performance of protocol surveys for the coastal California gnatcatcher (*Polioptila californica californica*). As such, this letter report summarizes the methodology and findings of surveys for this species at three locations in San Bernardino County, California, as part of the Santa Ana River Water Right Application for Supplemental Water Supply Project. SAIC conducted surveys in all scrub vegetation and adjacent areas within the three sites to determine the presence and location or absence of the coastal California gnatcatcher. No coastal California gnatcatchers were detected during the focused surveys. Incidental sightings of least Bell's vireos made during California gnatcatcher surveys are described in the Least Bell's Vireo Focused Survey Letter Report submitted concurrently with this report.

SITE LOCATION AND DESCRIPTION

The general location for the proposed project is southwestern San Bernardino County and western Riverside County. Within the overall project area, there are three specific geographical areas where ground disturbance, due to the construction of new conveyance facilities and associated structures, is proposed (Figure 1, *General Location of Construction Areas*, attached). The construction areas can be found on U.S. Geological Survey (USGS) San Bernardino North, Keller Peak, and Yucaipa, California quadrangles. The general areas and the respective proposed facilities contained within each are:

- 1) Santa Ana River Construction Area includes the canyon and alluvial fan area of the SAR immediately downstream of Seven Oaks Dam (SOD). The area would contain the following proposed facilities: Plunge Pool Pipeline; Low Flow Connector Pipeline; and Morton Canyon Connector II Pipeline (see Figure 2, *Santa Ana River Construction Area*, attached).
 - a) *Plunge Pool Pipeline*: The proposed Plunge Pool Pipeline (a 15-foot diameter, approximately 15,000-foot long, 1,500 cfs capacity pipeline) would connect the plunge pool of SOD to both the existing 6.5-foot diameter Foothill Feeder Pipeline and the 12-foot diameter Inland Feeder. The proposed alignment would originate in



Mr. Daniel Marquez
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the southeast quadrant of the plunge pool and travel along the southern bank of the SAR, cross under the river, and then parallel the northern riverbank until reaching the connection to the Foothill Feeder Pipeline and Inland Feeder near Cone Camp Road.

- b) *Low Flow Connector Pipeline*: The proposed Low Flow Connector Pipeline (a 4-foot diameter, approximately 3,500-foot long, 100 cfs capacity pipeline) would connect the existing Plunge Pool Bypass Pipeline at SOD to the Greenspot Pipeline. Along its entire length, the Low Flow Connector Pipeline would traverse the southern bank of the SAR. For most of its length, the pipeline would utilize the existing SOD access road.
 - c) *Morton Canyon Connector II Pipeline*: the proposed Morton Canyon Connector II Pipeline (a 4-foot diameter, approximately 1,900-foot long, 100 cfs capacity pipeline) would be constructed near the southern edge of the SAR wash east of Greenspot Road. It would connect the Greenspot Pump Station and the Greenspot Pipeline in an alignment parallel to the existing Morton Canyon Connector Pipeline.
- 2) Devil Canyon Construction Area is adjacent to the Devil Canyon Power Plant and Afterbays of the State Water Project (SWP). The area would contain the Devil Canyon By-Pass Pipeline (see Figure 3, *Devil Canyon Construction Area*, attached).
- a) *Devil Canyon By-Pass Pipeline*: This proposed pipeline (a 4.5-foot diameter, 110 cfs capacity pipeline) would connect the Foothill Feeder Pipeline to the Lytle Creek Pipeline (also called the Devil Canyon-Azusa Pipeline). This pipeline has two proposed alignments. The northern (shorter) alignment has a length of about 450 feet and connects the Foothill Feeder Pipeline with the Lytle Creek Pipeline. The southern alignment has a length of about 750 feet and is configured identically but with an additional hook-up to the Santa Ana Pipeline (owned and operated by California Department of Water Resources). Both of the proposed alignments are within a previously disturbed corridor that contains the Inland Feeder Pipeline.
- 3) Lower Lytle Creek Construction Area encompasses the alluvial fan area of lower Lytle Creek just north of the City of Rialto. The area would contain the following proposed facilities: Lower Lytle Creek Pipeline and Local Water Pickup; Cactus Basin Pipeline (see Figure 4, *Lower Lytle Creek Construction Area*, attached).
- a) *Lower Lytle Creek Pipeline*: This proposed pipeline would connect the Lytle Creek Pipeline to the existing Fontana Power Plant outflow canal. As illustrated in Figure 4, the pipeline would originate at the Lytle Creek Pipeline, either at the existing Lytle Creek turnout north east of Riverside Avenue near the northeast boundary of the City of Rialto, or at a new turnout adjacent to Riverside Avenue. From there the pipe would follow a southeasterly route along the northern edge of Riverside

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Avenue and connect to the existing Fontana Power Plant outflow canal. Water would flow into an existing, 1,200-foot long channel (currently used to convey tailwater from the power plant) that terminates into a series of existing ground water recharge basins.

VEGETATION

Plunge Pool Pipeline: The plunge pool is a circular pool, approximately 25-30 feet in depth. The banks of the pool have been graded to an approximate 2:1 slope and are armored with loose cobble. Immediately downstream of the plunge pool, the main stem of the SAR is a trapezoidal channel and the banks are also lined with loose boulders. This section of the active channel is about 1,500 feet in length, extends from the plunge pool to the Auxiliary Diversion Channel, and varies in width from about 60 feet at the exit of the plunge pool to about 160 feet at the intake of the Auxiliary Diversion Channel.

Along the proposed Plunge Pool Pipeline route, restored/recovering riparian habitat and established riparian habitat are present within the SAR channel from the vicinity of the plunge pool to the Southern California Edison (SCE) power house (SAR 2 and 3). Presently, this section of the channel supports mule fat scrub along its upper part and emergent southern cottonwood-willow riparian woodland and southern willow scrub along its lower portion. The southern willow scrub riparian vegetation is dominated by shrubby willows (including *Salix exigua* and *S. laevigata*) and emergent aquatic vegetation such as cattails (*Typha* sp.). Fremont's cottonwood (*Populus fremontii*) and a few western sycamore (*Platanus racemosa*) trees are also growing among the willows along the channel. The young southern willow scrub community has apparently established since completion of SOD in the late 1990's.

The predominant vegetation in the pipeline corridor north of the SAR channel and along Greenspot Road, as one moves west of the SAR canyon mouth, is characterized as Riversidean alluvial fan sage scrub (RAFSS), with early, intermediate, and mature phases all represented on or in close proximity to the pipeline alignment. Species observed along the pipeline corridor here include low native shrubs that are regarded as pioneer RAFSS species, prevalent following recent ground disturbance. These include brittlebush (*Encelia farinosa*), California buckwheat (*Eriogonum fasciculatum*), deerweed (*Lotus scoparius*), cudweed-aster (*Lessingia filaginifolia*), sweetbush (*Bebbia juncea*), California sagebrush (*Artemisia californica*), and goldenbush (*Ericameria* sp.). Areas less recently disturbed support most of the above-mentioned pioneer species but also include additional native shrub species such as chamise (*Adenostoma fasciculatum*), sugar bush (*Rhus ovata*), snake cholla (*Opuntia parryi*), our Lord's candle (*Yucca whipplei*), and yerba santa (*Eriodictyon trichocalyx*). Between the shrubs in areas with developed soil, weedy introduced European grasses such as rippgut (*Bromus diandrus*) and foxtail fescue

(*Vulpia myuros*) are prevalent, however some patches have few or no weeds and a prevalence of native annual wildflowers such as yellow pincushion (*Chaenactis glabriuscula*). Here and there patches of cryptogamic crust occur characterized by green and black mosses among the pebbles. These patches were relatively weed-free.

Much of western portion of the Plunge Pool Pipeline alignment follows the alignment of the existing 78-inch diameter Foothill Feeder Pipeline, which was installed in 1970. These areas are in an early successional stage and are marked by large rocks, cobbles, and boulders with scattered low shrubs, the most prevalent being brittlebush.

The older terraces adjacent to the disturbed pipeline corridor support a more mature RAFSS community and are dominated by chamise, with scattered redberry (*Rhamnus crocea*), large prickly pear cactus (*Opuntia* sp.), cholla cactus, our Lord's candle, birdsfoot fern (*Pellaea mucronata*) and live-forever (*Dudleya lanceolata*). Occasional large patches of sugarbush and individuals of Mexican elderberry (*Sambucus mexicana*) are scattered throughout the area. Shrub cover and numbers of native plant species are much higher on the older terraces than in the disturbed corridor.

Low Flow Connector: The Low Flow Connector Pipeline would occupy and would traverse the same types of habitats described above for the Plunge Pool Pipeline; principally SAR riverine habitat and areas previously disturbed during construction of SOD. Approximately one ½ mile downstream from the plunge pool, the alignment of the Low Flow Connector Pipeline would diverge from the Plunge Pool Pipeline corridor and turn to the southeast, ultimately connecting to the existing Greenspot pipeline located immediately south of the existing SCE power house (SAR 2 and 3) and the Redlands Aqueduct. To make this connection, the trench and pipeline would cross over areas that were previously disturbed during construction of SOD and an undisturbed side channel adjacent to the existing SCE structures and powerhouse. This side channel supports a mix of sage scrub and chaparral species, as well as individual mule fat plants, and invasive non-native species such as fountain grass (*Pennisetum setaceum*).

Morton Canyon Connector II: The Morton Canyon Connector II would be constructed at the base of an existing terrace and outside the armored left bank of the SAR in a narrow strip of land that supports degraded RAFSS habitat. This area has been disturbed previously by the construction of the dam, reconstruction of the SAR channel and channel armor, and by the installation of the Morton Canyon Connector I. This area presently supports sage scrub and chaparral species, as well as non-native grasses and ruderal species.

Devil Canyon By-Pass: The proposed Devil Canyon By-Pass site is located on the southern slope of the western San Bernardino Mountains just below the mouth of Devil Canyon. In general, the foothills in this area are mostly undisturbed with development occurring on the alluvial flats south of the foothills. However, within the immediate area of the proposed Devil Canyon By-Pass, severe disturbance has occurred during the installation of a number of major and minor water pipelines that merge in this area as well as many associated structures that occur on the surface. In addition, there are numerous access roads and staging facilities, some of which have been paved.

Plant communities within the area include Riversidean sage scrub, chaparral, southern willow scrub, mulefat scrub, and ruderal grassland. The southern willow scrub occurs along the Devil Canyon channel, which is part of the previously disturbed area. Adjacent to the disturbed area, the channel supports cottonwood (*Populus fremontii*), white alder (*Alnus rhombifolia*), willows (*Salix* spp.), and mule fat (*Baccharis salicifolia*). Most of the upland scrub habitat appears to be the result of revegetation efforts following previous construction. This disturbed Riversidean sage scrub tends to be dominated by a few shrub species, the most prevalent being California sagebrush, brittlebush, California buckwheat, and deerweed. Most of the area within the proposed construction corridor lies within the construction disturbance footprint of a recently completed portion of the Metropolitan Inland Feeder Pipeline.

Lower Lytle Creek Pipeline: The proposed alignment of the Lower Lytle Creek Pipeline is along the northern edge of Riverside Avenue. This major arterial street is close to the southern edge of Lytle Creek Wash near the confluence with Cajon Wash approximately four miles southwest of the proposed Devil Canyon By-Pass site.

The overall vegetation of Lytle Creek Wash is somewhat similar to that on the SAR alluvial fan. Nearly all of the vegetation adjacent to the Lytle Creek channel and spreading basins can be characterized as RAFSS. As described above, the RAFSS community type can be subdivided by age class. The surrounding habitat is intermediate to mature phase RAFSS. The mature phase RAFSS includes scattered sycamores and includes very large individuals of birchleaf mountain mahogany (up to 35 feet tall). The vegetation in the existing basins is sparse and mostly non-native due to the periodic mechanical clearing of the basins and adjacent berms.

Most of the area that would be disturbed by the project is along Riverside Drive and supports either disturbed RAFSS or no vegetation at all. The existing unlined channel, which currently receives intermittent flows from the Fontana Power Plant, supports a riparian community dominated by native species including mule fat,

arroyo willow, sandbar willow, mugwort, goldenrod, annual sunflower, and a variety of grasses and rushes. The basins support a combination of native species including coastal sagebrush, California buckwheat, scalebroom, matchweed, and deerweed along with colonies of weedy non-native species including tocalote, filaree, red brome, ragweed, castor bean, and giant reed. These weedy species are virtually absent from the adjoining RAFSS community, except in the near berms, basins, roads and other disturbed areas.

METHODOLOGY

Surveys for the coastal California gnatcatcher were conducted by SAIC biologist Marc Blain (Permit No. TE001075-1) and assisted by SAIC biologist Ted Mullen. Surveys were conducted in conformance with the U.S. Fish and Wildlife Service's *Coastal California Gnatcatcher Presence/Absence Survey Guidelines* (July 28, 1997). Accordingly, six surveys were performed during the breeding season within all portions of the project site containing suitable habitat. Each survey was conducted at least one week apart between 6:00 A.M. and 12:00 P.M. Temperatures during surveys ranged between 61 and 85 degrees Fahrenheit. Weather conditions were suitable for surveys with skies ranging from clear to 100 percent overcast, and winds below Beaufort scale 3. On one occasion, surveys were stopped for a brief period due to light precipitation.

Due to the amount of potentially suitable habitat and the distance between the three project locations, three separate survey areas were established.

1. The first survey area consisted of the stretch of the Plunge Pool Pipeline alignment that extends from the Inland Feeder to the Greenspot Road crossing.
2. The second survey area included the remaining portion of the Plunge Pool Pipeline alignment from the Greenspot Road crossing to the plunge pool, the Morton Canyon Connector alignment, and the Devil Canyon Bypass alignment.
3. The third area consisted of the Lower Lytle Creek Pipeline alignment.

Each of the three survey areas included no more than approximately 80 acres of potentially suitable gnatcatcher habitat.

The field investigator slowly walked through all potentially suitable habitat areas stopping at appropriate intervals, uttered pishing sounds, and played a tape of recorded coastal California gnatcatcher vocalizations. At each stop the tape was played for several seconds, followed by a brief pause to listen for a response. Surveys were conducted on March 17, 20, 21, April 2, 3, 4, 23, May 5, 6, 7, 12, 13, 14, 20, 21, June 12, 13, and 17, 2003. All birds observed or otherwise detected were recorded.

RESULTS

No coastal California gnatcatchers were detected within or adjacent to the project survey areas. Although much of the habitat surveyed is considered potentially suitable for gnatcatchers based on its plant species composition, sightings in the region are extremely rare (Burns et al 1998)¹ and occupation of these areas would be unexpected. Other sensitive species observed during coastal California gnatcatcher surveys include:

- sharp-shinned hawk (*Accipiter striatus*), CSC², [Santa Ana River and Lytle Creek]
- Coopers hawk (*Accipiter cooperii*), CSC, [Santa Ana River and Lytle Creek]
- northern harrier (*Circus cyaneus*), CSC, [Lytle Creek]
- Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), FSC³, CSC, [Santa Ana River and Lytle Creek]
- coastal cactus wren (*Campylorhynchus brunneicapillus couesi*), CSC, [Lytle Creek]
- least Bell's vireo (*Vireo bellii pusillus*) SE⁴, FE⁵, [Lytle Creek and Santa Ana River]
- California horned lizard (*Phrynosoma coronatum frontale*), CSC, [Lytle Creek]
- loggerhead shrike (*Lanius ludovicianus*), CSC, [Lytle Creek and Santa Ana River]

Details on the least Bell's vireos sightings are described in the *Least Bell's Vireo Focused Survey Letter Report* submitted concurrently with this report. Brown-headed cowbirds (*Molothrus ater*) were detected in each survey area on several occasions. All birds detected during California gnatcatcher surveys are listed in the Attachment A, *Bird Compendium*.

¹ 1998 burns, J, L. Davis and R. McKernan. 1998. History and Status of the California Gnatcatcher in San Bernardino County, California. *Western Birds*, Vol. 29, No. 4.

² CSC = California species of Special Concern

³ FSC = Federal species of Special Concern

⁴ SE = State Endangered

⁵ FE = Federally Endangered



Mr. Daniel Marquez
U.S. FISH AND WILDLIFE SERVICE
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Should you have any questions regarding the methodology or findings in this report, please do not hesitate to contact the undersigned at (626) 440-8351 or by e-mail at blainm@saic.com.

Sincerely,
SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

A handwritten signature in cursive script that reads "Marc Blain".

Marc Blain
Senior Biologist

Attachments

ATTACHMENT A: BIRD COMPENDIUM

Coastal California Gnatcatcher Survey Report
Santa Ana River Water Right Application for Supplemental Water Supply Project

<u>SCIENTIFIC NAME</u>	<u>COMMON NAME</u>
<u>Podicipedidae</u>	<u>Grebes</u>
<i>Podiceps nigricollis</i>	eared grebe
<u>Anatidae</u>	<u>Waterfowl</u>
<i>Anas platyrhynchos</i>	mallard
<i>Aythya collaris</i>	ring-necked duck
<u>Cathartidae</u>	<u>New World Vultures</u>
<i>Cathartes aura</i>	turkey vulture
<u>Accipitridae</u>	<u>Hawks</u>
<i>Circus cyaneus</i>	northern harrier
<i>Accipiter striatus</i>	sharp-shinned hawk
<i>Accipiter cooperii</i>	Cooper's hawk
<i>Buteo lineatus</i>	red-shouldered hawk
<i>Buteo jamaicensis</i>	red-tailed hawk
<u>Falconidae</u>	<u>Falcons</u>
<i>Falco sparverius</i>	American kestrel
<u>Odotophoridae</u>	<u>Quails</u>
<i>Callipepla californica</i>	California quail
<u>Rallidae</u>	<u>Rails and Gallinules</u>
<i>Fulica americana</i>	American coot
<u>Charadriidae</u>	<u>Plovers</u>
<i>Charadrius vociferus</i>	killdeer
<u>Scolopacidae</u>	<u>Sandpipers</u>
<i>Gallinago gallinago</i>	common snipe
<u>Columbidae</u>	<u>Pigeons and Doves</u>
<i>Columba livia</i>	rock dove
<i>Zenaidura macroura</i>	mourning dove
<u>Cuculidae</u>	<u>Cuckoos and Roadrunners</u>
<i>Geococcyx californianus</i>	greater roadrunner
<u>Strigidae</u>	<u>True Owls</u>
<i>Bubo virginianus</i>	great horned owl
<u>Caprimulgidae</u>	<u>Goatsuckers</u>

SCIENTIFIC NAME*Chordeiles acutipennis***Apodidae***Aeronautes saxatalis***Trochilidae***Calypte costae**Calypte anna***Picidae***Colaptes auratus**Picoides nuttalli***Tyrannidae***Contopus sordidulus**Empidonax difficilis**Sayornis nigricans**Sayornis saya**Myiarchus cinerascens**Tyrannus verticalis***Corvidae***Aphelocoma californica**Corvus brachyrhynchos**Corvus corax***Paridae***Baeolophus inornatus***Hirundinidae***Tachycineta thalassina**Stelgidopteryx serripennis**Hirundo rustica***Muscicapidae***Chamaea fasciata***Aegithalidae***Psaltriparus minimus***Troglodytidae***Campylorhynchus brunneicapillus couesi**Salpinctes obsoletus**Catherpes mexicanus**Troglodytes aedon**Thryomanes bewickii***COMMON NAME**

lesser nighthawk

Swifts

white-throated swift

Hummingbirds

Costa's hummingbird

Anna's hummingbird

Woodpeckers

northern flicker

Nuttall's woodpecker

Tyrant Flycatchers

western wood-pewee

Pacific-slope flycatcher

black phoebe

Say's phoebe

ash-throated flycatcher

western kingbird

Jays and Crows

western scrub-jay

American crow

common raven

Titmice

oak titmouse

Swallows

violet-green swallow

northern rough-winged swallow

barn swallow

Wrentits

wrentit

Bushtits

bushtit

Wrens

coastal cactus wren

rock wren

canyon wren

house wren

Bewick's wren

SCIENTIFIC NAME**COMMON NAME****Sylviidae***Polioptila caerulea***Turdidae***Turdus migratorius***Mimidae***Mimus polyglottos**Toxostoma redivivum***Ptilonotidae***Lanius ludovicianus***Bombycillidae***Bombycilla cedrorum***Laniidae***Phainopepla nitens***Vireonidae***Vireo bellii pusillus**Vireo gilvus**Vireo huttoni***Parulidae***Vermivora celata**Vermivora ruficapilla**Dendroica coronata**Dendroica nigrescens**Wilsonia pusilla**Geothlypis trichas***Thraupidae***Piranga ludoviciana***Emberizidae***Pipilo crissalis**Pipilo maculatus**Aimophila ruficeps canescens**Chondestes grammacus**Amphispiza belli**Passerculus sandwichensis**Melospiza melodia**Melospiza lincolni**Spizella passerina***Old World Warblers, Gnatcatchers**

blue-gray gnatcatcher

Thrushes

American robin

Thrashers

northern mockingbird

California thrasher

Shrikes

loggerhead shrike

Waxwings

cedar waxing

Silky Flycatchers

phainopepla

Vireos

least Bell's vireo

warbling vireo

Hutton's vireo

Wood Warblers

orange-crowned warbler

Nashville warbler

yellow-rumped warbler

black-throated gray warbler

Wilson's warbler

common yellowthroat

Tanagers

western tanager

Emberizids

California towhee

spotted towhee

Southern California rufous-crowned sparrow

lark sparrow

sage sparrow

savannah sparrow

song sparrow

Lincoln's sparrow

chipping sparrow

SCIENTIFIC NAME

Spizella breweri
Zonotrichia leucophrys

Cardinalidae

Guiraca caerulea
Passerina amoena
Pheucticus melanocephalus

Icteridae

Agelaius phoeniceus
Sturnella neglecta
Molothrus ater
Icterus bullockii
Icterus cucullatus

Fringillidae

Carpodacus mexicanus
Carduelis psaltria
Carduelis lawrencei

COMMON NAME

Brewer's sparrow
white-crowned sparrow

Cardinals

blue grosbeak
lazuli bunting
black-headed grosbeak

Blackbirds

Red-winged blackbird
western meadowlark
brown-headed cowbird
Bullock's oriole
hooded oriole

Finches

house finch
lesser goldfinch
Lawrence's goldfinch

Figure Attachments:

Figures originally attached to this report are identical to those attached to other focused survey reports. To avoid repetitiveness in this document, the figures are provided in only one location: as attachments to the San Bernardino Kangaroo Rat Focused Survey Report. Please refer to the figures using the same numbers as indicated within each individual report.



Science Applications International Corporation
An Employee-Owned Company

December 29, 2003

Mr. Daniel Marquez
U.S. Fish and Wildlife Service
Carlsbad Field Office
6010 Hidden Valley Road
Carlsbad, CA 92009

Re: Results of Focused Surveys for the Least Bell's Vireo on the Santa Ana River Water Right Application for Supplemental Water Supply Project Construction Sites, San Bernardino County, California

Dear Mr. Marquez:

This letter report summarizes the methodology and findings of protocol surveys for the state and federally endangered least Bell's vireo (*Vireo bellii pusillus*) conducted by Science Applications International Corporation (SAIC) biologist Marc Blain (Federal Permit #TE001075-1). Initial habitat assessments of the three construction areas associated with the Santa Ana River Water Right Application for Supplemental Water Supply Project revealed the presence of potentially suitable habitat in two of the three construction areas. SAIC conducted surveys in all riparian habitat and adjacent areas within the two construction areas to determine the presence and location or absence of the least Bell's vireo. No least Bell's vireos were detected during the focused surveys, however incidental sightings of least Bell's vireos made during Coastal California gnatcatcher surveys for this project are described below.

SITE LOCATION AND DESCRIPTION

The general location for the proposed project is southwestern San Bernardino County and western Riverside County, California. There are two specific geographical areas where suitable least Bell's vireo habitat occurs and ground disturbance, due to the construction of new conveyance facilities and associated structures, is proposed (Figure 1, *General Location of Construction Areas*, attached). The construction areas can be found on U.S. Geological Survey (USGS) San Bernardino North, Keller Peak, and Yucaipa, California quadrangles. The two areas and the respective proposed facilities contained within each are:

1. Santa Ana River Construction Area includes the mouth of the canyon and alluvial fan area of the SAR immediately downstream of Seven Oaks Dam (SOD). The area would contain the following proposed facilities: Plunge Pool Pipeline; Low Flow Connector Pipeline; and Morton Canyon Connector II Pipeline (see Figure 2, *Santa Ana River Construction Area*, attached).
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SAR, cross under the river, and then parallel the northern riverbank until reaching the connection to the Foothill Feeder Pipeline and Inland Feeder near Cone Camp Road.

- b. *Low Flow Connector Pipeline*: The proposed Low Flow Connector Pipeline (a 4-foot diameter, approximately 3,500-foot long, 100 cfs capacity pipeline) would connect the existing Plunge Pool Bypass Pipeline at SOD to the Greenspot Pipeline. Along its entire length, the Low Flow Connector Pipeline would traverse the southern bank of the SAR. For most of its length, the pipeline would utilize the existing SOD access road.
 - c. *Morton Canyon Connector II Pipeline*: the proposed Morton Canyon Connector II Pipeline (a 4-foot diameter, approximately 1,900-foot long, 100 cfs capacity pipeline) would be constructed near the southern edge of the SAR wash east of Greenspot Road. It would connect the Greenspot Pump Station and the Greenspot Pipeline in an alignment parallel to the existing Morton Canyon Connector Pipeline.
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- a. *Devil Canyon By-Pass Pipeline*: This proposed pipeline (a 4.5-foot diameter, 110 cfs capacity pipeline) would connect the Foothill Feeder Pipeline to the Lytle Creek Pipeline (also called the Devil Canyon-Azusa Pipeline). This pipeline has two proposed alignments. The northern (shorter) alignment has a length of about 450 feet and connects the Foothill Feeder Pipeline with the Lytle Creek Pipeline. The southern alignment has a length of about 750 feet and is configured identically but with an additional hook-up to the Santa Ana Pipeline (owned and operated by California Department of Water Resources). Both of the proposed alignments are within a previously disturbed corridor that contains the Inland Feeder Pipeline.

VEGETATION

Plunge Pool Pipeline: The plunge pool is a circular pool, approximately 25-30 feet in depth. The banks of the pool have been graded to an approximate 2:1 slope and are armored with loose cobble. Immediately downstream of the plunge pool, the main stem of the SAR is a trapezoidal channel and the banks are also lined with loose boulders. This section of the active channel is about 1,500 feet in length, extends from the plunge pool to the Auxiliary Diversion Channel, and varies in width from about 60 feet at the exit of the plunge pool to about 160 feet at the intake of the Auxiliary Diversion Channel.

Along the proposed Plunge Pool Pipeline route, restored/recovering riparian habitat and established riparian habitat are present within the SAR channel from the vicinity of the plunge pool to the Southern California Edison (SCE) power house (SAR 2 and

3. Presently, this section of the channel supports mule fat scrub along its upper part and emergent southern cottonwood-willow riparian woodland and southern willow scrub along its lower portion. The southern willow scrub riparian vegetation is dominated by shrubby willows (including *Salix exigua* and *S. laevigata*) and emergent aquatic vegetation such as cattails (*Typha* sp.). Fremont's cottonwood (*Populus fremontii*) and a few western sycamore (*Platanus racemosa*) trees are also growing among the willows along the channel. This young plant community has only established since completion of SOD in the late 1990's. Most of the potential habitat in this area is considered marginal quality for this species due to its immaturity and small patch size and would be unlikely to support least Bell's vireos.

The predominant vegetation in the pipeline corridor north of the SAR channel and along Greenspot Road, as one moves west of the SAR canyon mouth, is non-riparian and characterized as Riversidean alluvial fan sage scrub (RAFSS), and does not represent suitable habitat for the least Bell's vireo.

Low Flow Connector: The Low Flow Connector Pipeline would occupy and would traverse the same types of habitats described above for the Plunge Pool Pipeline; principally SAR riverine habitat and areas previously disturbed during construction of SOD. Approximately one ½ mile downstream from the plunge pool, the alignment of the Low Flow Connector Pipeline would diverge from the Plunge Pool Pipeline corridor and turn to the southeast, ultimately connecting to the existing Greenspot pipeline located immediately south of the existing SCE power house (SAR 2 and 3) and the Redlands Aqueduct. To make this connection, the trench and pipeline would cross over areas that were previously disturbed during construction of SOD and an undisturbed side channel adjacent to the existing SCE structures and powerhouse. This side channel supports a mix of sage scrub and chaparral species, as well as individual mule fat plants, and invasive non-native species such as fountain grass (*Pennisetum setaceum*).

Morton Canyon Connector II: The Morton Canyon Connector II would be constructed at the base of an existing terrace and outside the armored left bank of the SAR in a narrow strip of land that supports degraded RAFSS habitat. This area has been disturbed previously by the construction of the dam, reconstruction of the SAR channel and channel armor, and by the installation of the Morton Canyon Connector I. This area presently supports sage scrub and chaparral species, as well as non-native grasses and ruderal species.

Devil Canyon By-Pass: The proposed Devil Canyon By-Pass site is located on the southern slope of the western San Bernardino Mountains just below the mouth of Devil

Mr. Daniel Marquez
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Canyon. In general, the foothills in this area are mostly undisturbed with development occurring on the alluvial flats south of the foothills. However, within the immediate area of the proposed Devil Canyon By-Pass, severe disturbance has occurred during the installation of a number of major and minor water pipelines merge in this area as well as many associated structures that occur on the surface. In addition, there are numerous access roads and staging facilities, some of which have been paved.

Plant communities within the area include Riversidean sage scrub, chaparral, southern willow scrub, mulefat scrub, and ruderal grassland. The southern willow scrub occurs along the Devil Canyon channel, which is part of the previously disturbed area. Adjacent to the disturbed area, the channel supports cottonwood (*Populus fremontii*), white alder (*Alnus rhombifolia*), willows (*Salix* spp.), and mule fat (*Baccharis salicifolia*). Most of the upland scrub habitat appears to be the result of revegetation efforts following previous construction. This disturbed Riversidean sage scrub tends to be dominated by a few shrub species, the most prevalent being California sagebrush, brittlebush, California buckwheat, and deerweed. Most of the area within the proposed construction corridor lies within the construction disturbance footprint of a recently completed portion of the Metropolitan Inland Feeder Pipeline.

METHODOLOGY

Surveys for the least Bell's vireo were conducted by SAIC biologist Marc Blain (Permit No. TE001075-1) and assisted by SAIC biologist Ted Mullen. Methods employed were in conformance with U.S. Fish and Wildlife Service protocol (April, 1999). Accordingly, eight surveys were conducted between April 10 and July 31. Surveys were performed no less than ten days apart, between the hours of 6:00 am and 11:00 am, within all portions of the study area containing suitable riparian habitat and adjacent habitat potentially used for foraging. Temperatures during surveys ranged between 58 and 81 degrees Fahrenheit. Weather conditions were suitable for surveys with skies ranging from clear to 100 percent overcast, and winds below Beaufort scale 2.

Due to the limited amount of potentially suitable habitat and the close proximity of the two project construction locations, all potentially suitable habitat (approximately 10 acres) in both areas was surveyed during a single survey period. The field investigators slowly walked along the riparian habitat, stopping at approximately 150- to 200-foot intervals, looking and listening for least Bell's vireo. Surveys were conducted on April 10, 22, May 2, 15, June 11, 23, July 3, and 17. All birds observed or otherwise detected were recorded.

RESULTS

No least Bell's vireos were detected within or adjacent to the project survey areas during focused surveys. Most of the habitat on-site is considered marginal quality for this species due to



Mr. Daniel Marquez
U.S. FISH AND WILDLIFE SERVICE
December 29, 2003 - Page 5

its immaturity and small patch size and would be unlikely to support least Bell's vireos. Other sensitive species observed during surveys included the sharp-shinned hawk (*Accipiter striatus*), [California species of Special Concern] and Coopers hawk (*Accipiter cooperii*), [California species of Special Concern]. Brown-headed cowbirds (*Molothrus ater*) were detected in each survey area on several occasions. All birds detected during least Bell's vireo surveys are listed in Attachment A, *Bird Compendium*.

Although the least Bell's vireo was not detected during these surveys, two individuals of this species were detected during protocol surveys for the California gnatcatcher conducted in other portions of the project construction areas. These areas were not included in the least Bell's vireo survey area due to a lack of habitat considered suitable for the least Bell's vireo. Both birds were unexpectedly observed in atypical vireo habitat but were not exhibiting nesting behavior.

Near the Santa Ana River construction area, a single bird was heard calling and visually observed on May 7 in a patch of western sycamores on a hillside near the Foothill Pipeline Surge Riser north of Greenspot Road and approximately 350 feet north of the proposed project's direct impact area. A second observation of a single bird was made in the same area on May 14. Subsequent surveys included rigorous inspection of this specific area and the surroundings; however vireos were not detected again.

The second least Bell's vireo observation location was at the Lytle Creek construction area. A single bird was heard calling and visually observed on May 6 within the unlined canal midway between the Fontana Power Plant and the recharge basins. This bird was observed on the two subsequent surveys (May 13 and 20) but was not observed during later site visits. The bird called continuously for long periods on all three occasions but no nest or other individual was observed. Habitat within the channel is atypical vireo habitat and consists almost exclusively of sparse immature mule fat plants, a few sandbar willow, and mountain mahogany overlapping from the adjacent alluvial scrub community. A small patch of willow woodland (less than a quarter acre) exists approximately 100 feet north of the main observation area. The vireo was banded with solid silver on the left leg and yellow/black/yellow/black/yellow from the top on the right leg.

Should you have any questions regarding the methodology or findings in this report, please do not hesitate to contact the undersigned at (626) 440-8351 or by e-mail at blainm@saic.com.

Sincerely,
SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

A handwritten signature in cursive script that reads "Marc Blain".

Marc Blain
Senior Biologist

Attachments

ATTACHMENT A: BIRD COMPENDIUM

Least Bell's Vireo Survey Report Santa Ana River Water Right Application for Supplemental Water Supply Project

SCIENTIFIC NAME

Podicipedidae

Podiceps nigricollis

Anatidae

Anas platyrhynchos

Cathartidae

Cathartes aura

Accipitridae

Accipiter striatus

Accipiter cooperii

Buteo lineatus

Buteo jamaicensis

Falconidae

Falco sparverius

Odotophoridae

Callipepla californica

Rallidae

Fulica americana

Charadriidae

Charadrius vociferus

Columbidae

Columba livia

Zenaida macroura

Cuculidae

Geococcyx californianus

Strigidae

Bubo virginianus

Apodidae

Aeronautes saxatalis

Trochilidae

Calypte costae

Calypte anna

COMMON NAME

Grebes

eared grebe

Waterfowl

mallard

New World Vultures

turkey vulture

Hawks

sharp-shinned hawk

Cooper's hawk

red-shouldered hawk

red-tailed hawk

Falcons

American kestrel

Quails

California quail

Rails and Gallinules

American coot

Plovers

killdeer

Pigeons and Doves

rock dove

mourning dove

Cuckoos and Roadrunners

greater roadrunner

True Owls

great horned owl

Swifts

white-throated swift

Hummingbirds

Costa's hummingbird

Anna's hummingbird

SCIENTIFIC NAME**COMMON NAME****Picidae***Colaptes auratus**Picoides nuttalli***Tyrannidae***Contopus sordidulus**Empidonax difficilis**Sayornis nigricans**Sayornis saya**Myiarchus cinerascens**Tyrannus verticalis***Corvidae***Aphelocoma californica**Corvus brachyrhynchos**Corvus corax***Paridae***Baeolophus inornatus***Hirundinidae***Tachycineta thalassina**Stelgidopteryx serripennis**Hirundo rustica***Muscicapidae***Chamaea fasciata***Aegithalidae***Psaltriparus minimus***Troglodytidae***Salpinctes obsoletus**Catherpes mexicanus**Troglodytes aedon**Thryomanes bewickii***Sylviidae***Poliophtila caerulea***Turdidae***Turdus migratorius***Mimidae***Mimus polyglottos**Toxostoma redivivum***Woodpeckers**

northern flicker

Nuttall's woodpecker

Tyrant Flycatchers

western wood-pewee

Pacific-slope flycatcher

black phoebe

Say's phoebe

ash-throated flycatcher

western kingbird

Jays and Crows

western scrub-jay

American crow

common raven

Titmice

oak titmouse

Swallows

violet-green swallow

northern rough-winged swallow

barn swallow

Wrentits

wrentit

Bushtits

bushtit

Wrens

rock wren

canyon wren

house wren

Bewick's wren

Old World Warblers, Gnatcatchers

blue-gray gnatcatcher

Thrushes

American robin

Thrashers

northern mockingbird

California thrasher

SCIENTIFIC NAME**COMMON NAME****Bombycillidae***Bombycilla cedrorum***Laniidae***Phainopepla nitens***Vireonidae***Vireo gilvus***Parulidae***Vermivora celata**Vermivora ruficapilla**Dendroica coronata**Dendroica nigrescens**Wilsonia pusilla**Geothlypis trichas***Thraupidae***Piranga ludoviciana***Emberizidae***Pipilo crissalis**Pipilo maculatus**Aimophila ruficeps canescens**Melospiza melodia**Zonotrichia leucophrys***Cardinalidae***Guiraca caerulea**Passerina amoena**Pheucticus melanocephalus***Icteridae***Agelaius phoeniceus**Sturnella neglecta**Molothrus ater**Icterus bullockii**Icterus cucullatus***Fringillidae***Carpodacus mexicanus**Carduelis psaltria**Carduelis lawrencei***Waxwings**

cedar waxing

Silky Flycatchers

phainopepla

Vireos

warbling vireo

Wood Warblers

orange-crowned warbler

Nashville warbler

yellow-rumped warbler

black-throated gray warbler

Wilson's warbler

common yellowthroat

Tanagers

western tanager

Emberizids

California towhee

spotted towhee

Southern California rufous-crowned sparrow

song sparrow

white-crowned sparrow

Cardinals

blue grosbeak

lazuli bunting

black-headed grosbeak

Blackbirds

Red-winged blackbird

western meadowlark

brown-headed cowbird

Bullock's oriole

hooded oriole

Finches

house finch

lesser goldfinch

Lawrence's goldfinch

Figure Attachments:

Figures originally attached to this report are identical to those attached to other focused survey reports. To avoid repetitiveness in this document, the figures are provided in only one location: as attachments to the San Bernardino Kangaroo Rat Focused Survey Report. Please refer to the figures using the same numbers as indicated within each individual report.



Science Applications International Corporation
An Employee-Owned Company

December 29, 2003

Mr. Daniel Marquez
U.S. Fish and Wildlife Service
Carlsbad Field Office
6010 Hidden Valley Road
Carlsbad, CA 92009

Re: Results of Focused Surveys for the Southwestern Willow Flycatcher on the Santa Ana River Water Right Application for Supplemental Water Supply Project Construction Sites, San Bernardino County, California

Dear Mr. Marquez:

This letter/report summarizes the methodology and findings of protocol surveys for the state and federally endangered southwestern willow flycatcher (*Empidonax traillii extimus*) conducted by Science Applications International Corporation (SAIC) biologist Marc Blain (Federal Permit #TE001075-1). Initial habitat assessments of the three construction areas associated with the Santa Ana River Water Right Application for Supplemental Water Supply Project revealed the presence of potentially suitable habitat in two of the three construction areas. SAIC conducted surveys in all riparian habitat and adjacent areas within the two construction areas to determine the presence and location or absence of the southwestern willow flycatcher. No southwestern willow flycatchers were detected during the focused surveys.

SITE LOCATION AND DESCRIPTION

The general location for the proposed project is southwestern San Bernardino County and western Riverside County, California. The two specific geographical areas where suitable southwestern willow flycatcher habitat occurs and ground disturbance, due to the construction of new conveyance facilities and associated structures, is proposed are described below (Figure 1, *General Location of Construction Areas*, attached). The construction areas can be found on U.S. Geological Survey (USGS) San Bernardino North, Keller Peak, and Yucaipa, California quadrangles. The general areas and the respective facilities contained within each are:

- 1) Santa Ana River Construction Area includes the mouth of the canyon and alluvial fan area of the SAR immediately downstream of Seven Oaks Dam (SOD). The area would contain the following proposed facilities: Plunge Pool Pipeline; Low Flow Connector Pipeline; and Morton Canyon Connector II Pipeline (see Figure 2, *Santa Ana River Construction Area*, attached).
 - a) *Plunge Pool Pipeline*: The proposed Plunge Pool Pipeline (a 15-foot diameter, approximately 15,000-foot long, 1,500 cfs capacity pipeline) would connect the plunge pool of SOD to both the existing 6.5-foot diameter Foothill Feeder Pipeline and the 12-foot diameter Inland Feeder. The proposed alignment would originate in the southeast quadrant of the plunge pool and travel along the southern bank of the



Mr. Daniel Marquez
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SAR, cross under the river, and then parallel the northern riverbank until reaching the connection to the Foothill Feeder Pipeline and Inland Feeder near Cone Camp Road.

- b) *Low Flow Connector Pipeline*: The proposed Low Flow Connector Pipeline (a 4-foot diameter, approximately 3,500-foot long, 100 cfs capacity pipeline) would connect the existing Plunge Pool Bypass Pipeline at SOD to the Greenspot Pipeline. Along its entire length, the Low Flow Connector Pipeline would traverse the southern bank of the SAR. For most of its length, the pipeline would utilize the existing SOD access road.
- c) *Morton Canyon Connector II Pipeline*: the proposed Morton Canyon Connector II Pipeline (a 4-foot diameter, approximately 1,900-foot long, 100 cfs capacity pipeline) would be constructed near the southern edge of the SAR wash east of Greenspot Road. It would connect the Greenspot Pump Station and the Greenspot Pipeline in an alignment parallel to the existing Morton Canyon Connector Pipeline.

2) Devil Canyon Construction Area is adjacent to the Devil Canyon Power Plant and Afterbays of the State Water Project (SWP). The area would contain the Devil Canyon By-Pass Pipeline (see Figure 3, *Devil Canyon Construction Area*, attached).

- d) *Devil Canyon By-Pass Pipeline*: This proposed pipeline (a 4.5-foot diameter, 110 cfs capacity pipeline) would connect the Foothill Feeder Pipeline to the Lytle Creek Pipeline (also called the Devil Canyon-Azusa Pipeline). This pipeline has two proposed alignments. The northern (shorter) alignment has a length of about 450 feet and connects the Foothill Feeder Pipeline with the Lytle Creek Pipeline. The southern alignment has a length of about 750 feet and is configured identically but with an additional hook-up to the Santa Ana Pipeline (owned and operated by California Department of Water Resources). Both of the proposed alignments are within a previously disturbed corridor that contains the Inland Feeder Pipeline.

VEGETATION

Plunge Pool Pipeline: The plunge pool is a circular pool, approximately 25-30 feet in depth. The banks of the pool have been graded to an approximate 2:1 slope and are armored with loose cobble. Immediately downstream of the plunge pool, the main stem of the SAR is a trapezoidal channel and the banks are also lined with loose boulders. This section of the active channel is about 1,500 feet in length, extends from the plunge pool to the Auxiliary Diversion Channel, and varies in width from about 60 feet at the exit of the plunge pool to about 160 feet at the intake of the Auxiliary Diversion Channel.

Along the proposed Plunge Pool Pipeline route, restored/recovering riparian habitat and established riparian habitat are present within the SAR channel from the vicinity of the plunge pool to the Southern California Edison (SCE) power house (SAR 2 and 3). Presently, this section of the channel supports mule fat scrub along its upper part and emergent southern cottonwood-willow riparian woodland and southern willow scrub along its lower portion. The southern willow scrub riparian vegetation is dominated by shrubby willows (including *Salix exigua* and *S. laevigata*) and emergent aquatic vegetation such as cattails (*Typha* sp.). Fremont's cottonwood (*Populus fremontii*) and a few western sycamore (*Platanus racemosa*) trees are also growing among the willows along the channel. This young plant community has only been established since completion of SOD in the late 1990's. Most of the potential habitat in this area is considered marginal quality for this species due to its immaturity and small patch size and would be unlikely to support southwestern willow flycatchers.

The predominant vegetation in the pipeline corridor north of the SAR channel and along Greenspot Road, as one moves west of the SAR canyon mouth, is non-riparian, characterized as Riversidean alluvial fan sage scrub (RAFSS), and does not represent suitable habitat for the southwestern willow flycatcher.

Low Flow Connector: The Low Flow Connector Pipeline would occupy and would traverse the same types of habitats described above for the Plunge Pool Pipeline; principally SAR riverine habitat and areas previously disturbed during construction of SOD. Approximately one ½ mile downstream from the plunge pool, the alignment of the Low Flow Connector Pipeline would diverge from the Plunge Pool Pipeline corridor and turn to the southeast, ultimately connecting to the existing Greenspot pipeline located immediately south of the existing SCE power house (SAR 2 and 3) and the Redlands Aqueduct. To make this connection, the trench and pipeline would cross over areas that were previously disturbed during construction of SOD and an undisturbed side channel adjacent to the existing SCE structures and powerhouse. This side channel supports a mix of sage scrub and chaparral species, as well as individual mule fat plants, and invasive non-native species such as fountain grass (*Pennisetum setaceum*).

Morton Canyon Connector II: The Morton Canyon Connector II would be constructed at the base of an existing terrace and outside the armored left bank of the SAR in a narrow strip of land that supports degraded RAFSS habitat. This area has been disturbed previously by the construction of the dam, reconstruction of the SAR channel and channel armor, and by the installation of the Morton Canyon Connector I. This area presently supports sage scrub and chaparral species, as well as non-native grasses and ruderal species.



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Devil Canyon By-Pass: The proposed Devil Canyon By-Pass site is located on the southern slope of the western San Bernardino Mountains just below the mouth of Devil Canyon. In general, the foothills in this area are mostly undisturbed with development occurring on the alluvial flats south of the foothills. However, within the immediate area of the proposed Devil Canyon By-Pass, severe disturbance has occurred during the installation of a number of major and minor water pipelines merge in this area as well as many associated structures that occur on the surface. In addition, there are numerous access roads and staging facilities, some of which have been paved.

Plant communities within the area include Riversidean sage scrub, chaparral, southern willow scrub, mulefat scrub, and ruderal grassland. The southern willow scrub occurs along the Devil Canyon channel, which is part of the previously disturbed area. Adjacent to the disturbed area, the channel supports cottonwood (*Populus fremontii*), white alder (*Alnus rhombifolia*), willows (*Salix* spp.), and mule fat (*Baccharis salicifolia*). Most of the upland scrub habitat appears to be the result of revegetation efforts following previous construction. This disturbed Riversidean sage scrub tends to be dominated by a few shrub species, the most prevalent being California sagebrush, brittlebush, California buckwheat, and deerweed. Most of the area within the proposed construction corridor lies within the construction disturbance footprint of a recently completed portion of the Metropolitan Inland Feeder Pipeline.

METHODOLOGY

Surveys for the southwestern willow flycatcher were conducted by SAIC biologist Marc Blain (Permit No. TE001075-1) and assisted by SAIC biologist Ted Mullen. Methods employed were in conformance with *Southwestern Willow Flycatcher Presence/Absence Survey Guidelines*, issued by the United States Fish and Wildlife Service on July 11, 2000. Accordingly, a total of five surveys were conducted, one in the first designated survey period, one in the second survey period and three in the final period. Surveys were performed between the hours of 6:00 am and 11:00 am, within all portions of the study area containing suitable riparian habitat and adjacent habitat potentially used for foraging. Temperatures during surveys ranged between 58 and 81 degrees Fahrenheit. Weather conditions were suitable for surveys with skies ranging from clear to 100 percent overcast, and winds below Beaufort scale 2.

Due to the limited amount of potentially suitable habitat and the close proximity of the two project construction locations, all potentially suitable habitat (approximately 10 acres) in both areas was surveyed during a single survey period. The permitted field investigator slowly walked through riparian habitat areas, stopping at appropriate intervals, and played a tape of recorded southwestern willow flycatcher vocalizations. The tape was played for several seconds at each



Mr. Daniel Marquez
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stop, followed by a long pause to listen for a response. Surveys were conducted on May 15, June 11, 23, July 3, and 17. All birds observed or otherwise detected were recorded.

RESULTS

No southwestern willow flycatchers were detected within or adjacent to the project survey areas during focused surveys. Most of the habitat on-site is considered marginal quality for this species due to its immaturity and small patch size and would be unlikely to support southwestern willow flycatchers. Other sensitive species observed during surveys included the sharp-shinned hawk (*Accipiter striatus*), [California species of Special Concern] and Coopers hawk (*Accipiter cooperii*), [California species of Special Concern]. Brown-headed cowbirds (*Molothrus ater*) were detected in each survey area on several occasions. All birds detected during southwestern willow flycatcher surveys are listed in Attachment A, *Bird Compendium*.

Should you have any questions regarding the methodology or findings in this report, please do not hesitate to contact the undersigned at (626) 440-8351 or by e-mail at blainm@saic.com.

Sincerely,
SCIENCE APPLICATIONS INTERNATIONAL CORPORATION

A handwritten signature in cursive script that reads "Marc Blain".

Marc Blain
Senior Biologist

Attachments

ATTACHMENT A: BIRD COMPENDIUM

Southwestern Willow Flycatcher Survey Report
 Santa Ana River Water Right Application for Supplemental Water Supply Project

SCIENTIFIC NAME	COMMON NAME
<u>Podicipedidae</u>	<u>Grebes</u>
<i>Podiceps nigricollis</i>	eared grebe
<u>Anatidae</u>	<u>Waterfowl</u>
<i>Anas platyrhynchos</i>	mallard
<u>Cathartidae</u>	<u>New World Vultures</u>
<i>Cathartes aura</i>	turkey vulture
<u>Accipitridae</u>	<u>Hawks</u>
<i>Accipiter striatus</i>	sharp-shinned hawk
<i>Accipiter cooperii</i>	Cooper's hawk
<i>Buteo lineatus</i>	red-shouldered hawk
<i>Buteo jamaicensis</i>	red-tailed hawk
<u>Falconidae</u>	<u>Falcons</u>
<i>Falco sparverius</i>	American kestrel
<u>Odotophoridae</u>	<u>Quails</u>
<i>Callipepla californica</i>	California quail
<u>Rallidae</u>	<u>Rails and Gallinules</u>
<i>Fulica americana</i>	American coot
<u>Charadriidae</u>	<u>Plovers</u>
<i>Charadrius vociferus</i>	killdeer
<u>Columbidae</u>	<u>Pigeons and Doves</u>
<i>Columba livia</i>	rock dove
<i>Zenaidura macroura</i>	mourning dove
<u>Cuculidae</u>	<u>Cuckoos and Roadrunners</u>
<i>Geococcyx californianus</i>	greater roadrunner
<u>Strigidae</u>	<u>True Owls</u>
<i>Bubo virginianus</i>	great horned owl
<u>Apodidae</u>	<u>Swifts</u>
<i>Aeronautes saxatalis</i>	white-throated swift
<u>Trochilidae</u>	<u>Hummingbirds</u>
<i>Calypte costae</i>	Costa's hummingbird
<i>Calypte anna</i>	Anna's hummingbird

SCIENTIFIC NAME**COMMON NAME****Picidae***Colaptes auratus**Picoides nuttallii***Tyrannidae***Contopus sordidulus**Empidonax difficilis**Sayornis nigricans**Sayornis saya**Myiarchus cinerascens**Tyrannus verticalis***Corvidae***Aphelocoma californica**Corvus brachyrhynchos**Corvus corax***Paridae***Baeolophus inornatus***Hirundinidae***Tachycineta thalassina**Stelgidopteryx serripennis**Hirundo rustica***Muscicapidae***Chamaea fasciata***Aegithalidae***Psaltriparus minimus***Troglodytidae***Salpinctes obsoletus**Catherpes mexicanus**Troglodytes aedon**Thryomanes bewickii***Sylviidae***Poliophtila caerulea***Turdidae***Turdus migratorius***Mimidae***Mimus polyglottos**Toxostoma redivivum***Woodpeckers**

northern flicker

Nuttall's woodpecker

Tyrant Flycatchers

western wood-pewee

Pacific-slope flycatcher

black phoebe

Say's phoebe

ash-throated flycatcher

western kingbird

Jays and Crows

western scrub-jay

American crow

common raven

Titmice

oak titmouse

Swallows

violet-green swallow

northern rough-winged swallow

barn swallow

Wrentits

wrentit

Bushtits

bushtit

Wrens

rock wren

canyon wren

house wren

Bewick's wren

Old World Warblers, Gnatcatchers

blue-gray gnatcatcher

Thrushes

American robin

Thrashers

northern mockingbird

California thrasher

SCIENTIFIC NAME**COMMON NAME****Bombycillidae***Bombycilla cedrorum***Laniidae***Phainopepla nitens***Vireonidae***Vireo gilvus***Parulidae***Vermivora celata**Vermivora ruficapilla**Dendroica coronata**Dendroica nigrescens**Wilsonia pusilla**Geothlypis trichas***Thraupidae***Piranga ludoviciana***Emberizidae***Pipilo crissalis**Pipilo maculatus**Aimophila ruficeps canescens**Melospiza melodia**Zonotrichia leucophrys***Cardinalidae***Guiraca caerulea**Passerina amoena**Pheucticus melanocephalus***Icteridae***Agelaius phoeniceus**Sturnella neglecta**Molothrus ater**Icterus bullockii**Icterus cucullatus***Fringillidae***Carpodacus mexicanus**Carduelis psaltria**Carduelis lawrencei***Waxwings**

cedar waxing

Silky Flycatchers

phainopepla

Vireos

warbling vireo

Wood Warblers

orange-crowned warbler

Nashville warbler

yellow-rumped warbler

black-throated gray warbler

Wilson's warbler

common yellowthroat

Tanagers

western tanager

Emberizids

California towhee

spotted towhee

Southern California rufous-crowned sparrow

song sparrow

white-crowned sparrow

Cardinals

blue grosbeak

lazuli bunting

black-headed grosbeak

Blackbirds

Red-winged blackbird

western meadowlark

brown-headed cowbird

Bullock's oriole

hooded oriole

Finches

house finch

lesser goldfinch

Lawrence's goldfinch

Figure Attachments:

Figures originally attached to this report are identical to those attached to other focused survey reports. To avoid repetitiveness in this document, the figures are provided in only one location: as attachments to the San Bernardino Kangaroo Rat Focused Survey Report. Please refer to the figures using the same numbers as indicated within each individual report.

September 8, 2004

SJMBC.622

Mr. Daniel Marquez
U.S. Fish and Wildlife Service
Carlsbad Field Office
6010 Hidden Valley Road
Carlsbad, CA 92009

Re: Results of Focused San Bernardino kangaroo rat (*Dipodomys merriami parvus*) (SBKR) surveys on the Santa Ana River Water Right Application for Supplemental Water Supply Project Construction Sites, San Bernardino County, California

Dear Mr. Marquez:

This letter report is prepared in compliance with the conditions of an authorized permit issued under Section 10(a)(1)(A) of the Federal Endangered Species Act to SJM Biological Consultants (SJMBBC) (Stephen J. Montgomery) (USFWS Permit TE 745541-8) for the performance of protocol surveys for the San Bernardino kangaroo rat (SBKR). As such, this letter report summarizes the methodology and findings of surveys for this species at three locations in San Bernardino County, California, as part of the Santa Ana River Water Right Application for Supplemental Water Supply Project. SJMBBC conducted trapping surveys in all potentially suitable habitats within two of the three sites to determine the presence and location or absence of the SBKR. The SBKR was captured at two locations at the Lower Lytle Creek site. No SBKR were detected during the focused trapping surveys at the Santa Ana River sites. Although no trapping was conducted at the Devil Canyon site, a preliminary (i.e. non-trapping) assessment of kangaroo rat sign at that site indicated that the resident kangaroo rat was the un-listed Dulzura kangaroo rat (*Dipodomys simulans*) (DKR).

BACKGROUND INFORMATION

The SBKR historically ranged from the San Bernardino Valley in San Bernardino County to Menifee Valley in Riverside County, with at least 25 separate localities identified. Currently, populations of the SBKR are limited to seven widely separated locations in San Bernardino and Riverside Counties, four of which (City Creek, Etiwanda, Reche Canyon, and South Bloomington) support only small, remnant populations. The Santa Ana River, Lytle and Cajon washes, and the San Jacinto River support the largest extant concentrations of SBKR and suitable habitat (approximately 3,200 acres total). This total area of occupied habitat occurs across a mosaic of approximately 13,697 acres of potentially suitable habitat; however, all but the 3,215 occupied acres are currently more mature than the open, early successional habitat type required by the SBKR (USFWS 1998a).

General natural history features and habitat requirements of the SBKR are relatively well known. The species is found primarily on sandy and loamy sand substrates, where they can readily excavate simple, shallow burrows. Within the range of the SBKR, this type of substrate is typically associated with alluvial scrub vegetation, a relatively uncommon desert-influenced vegetation type

in southern California that develops on alluvial fans and floodplains subjected to scouring and deposition during periodic flood events.

The SBKR prefers open habitats characterized by a low-stature, relatively open shrub canopy cover (<22 percent cover). Habitats occupied by the SBKR also typically exhibit a reduced herbaceous cover with low abundances of European grasses (i.e. primarily brome grasses). This type of habitat is typical of early- and intermediate-phase alluvial scrub communities, which are subjected to relatively frequent flooding/scouring (McKernan 1997; MEC 2000; USFWS 1998a,b). The open vegetation structure of these communities supports the highest densities of the SBKR. The amount of rock in the soil also is an important determinant of a habitat's suitability for this species. In general, soils exhibiting high densities of rocks and boulders, with a corresponding scarcity of open sandy substrate, are very rarely occupied by the SBKR, presumably due to the difficulty of excavating burrows in such "armed" soils (S.J. Montgomery, pers. observ.).

Mature-phase alluvial scrub communities, which typically are located on higher terraces above the more active river channels, are rarely affected by flooding events and subsequently develop a higher density of both shrub and non-native grass cover, and occasionally contain trees. The SBKR rarely occurs in the mature phase of this vegetation type. However, some confusion has arisen regarding the definition of alluvial scrub; thus, it is necessary to clearly define the conditions prevailing in any alluvial scrub community under study, before its suitability for SBKR can be ascertained. The SBKR has been trapped in mature RAFSS, and the relative importance and make-up of this community type to the long-term viability of SBKR populations remains to be determined.

The SBKR is known to occur within the immediate vicinity of some portions of the Santa Ana River and Lower Lytle Creek proposed project sites (MEC 2000; Montgomery 2000, 1998a,b). A trapping survey for SBKR by Philippe Vergne in the past few years (personal communication 2003) in the area surrounding the Corps of Engineers buildings, upstream from Greenspot Road, failed to detect this species. All three sites occur within designated Critical Habitat of this species (USFWS 2002).

SITE LOCATION AND DESCRIPTION

The general location for the proposed project is southwestern San Bernardino County and western Riverside County. Within the overall project area, there are three specific geographical areas where ground disturbance, due to the construction of new conveyance facilities and associated structures, is proposed (Figure 1, *General Location of Construction Areas*, attached). The construction areas can be found on U.S. Geological Survey (USGS) San Bernardino North, Keller Peak, and Yucaipa, California quadrangles. The general areas and the respective proposed facilities contained within each are:

- 1) Santa Ana River Construction Area includes the canyon and alluvial fan area of the SAR immediately downstream of Seven Oaks Dam (SOD). The area would contain the following proposed facilities: Plunge Pool Pipeline; Low Flow Connector Pipeline; and Morton Canyon Connector II Pipeline (see Figure 2, *Santa Ana River Construction Area*, attached).
 - a) *Plunge Pool Pipeline*: The proposed Plunge Pool Pipeline (a 15-foot diameter, approximately 15,000-foot long, 1,500 cfs capacity pipeline) would connect the plunge pool of SOD to both the existing 6.5-foot diameter Foothill Feeder Pipeline and the 12-foot diameter Inland Feeder. The proposed alignment would originate in the southeast quadrant of the plunge pool and travel along the southern bank of the SAR, cross under the river, and then parallel the northern riverbank until reaching the connection to the Foothill Feeder Pipeline and Inland Feeder near Cone Camp Road.
 - b) *Low Flow Connector Pipeline*: The proposed Low Flow Connector Pipeline (a 4-foot diameter, approximately 3,500-foot long, 100 cfs capacity pipeline) would connect the existing Plunge Pool Bypass Pipeline at SOD to the Greenspot Pipeline. Along its entire length, the Low Flow Connector Pipeline would traverse the southern bank of the SAR. For most of its length, the pipeline would utilize the existing SOD access road.
 - c) *Morton Canyon Connector II Pipeline*: the proposed Morton Canyon Connector II Pipeline (a 4-foot diameter, approximately 1,900-foot long, 100 cfs capacity pipeline) would be constructed near the southern edge of the SAR wash east of Greenspot Road. It would connect the Greenspot Pump Station and the Greenspot Pipeline in an alignment parallel to the existing Morton Canyon Connector Pipeline.
- 2) Devil Canyon Construction Area is adjacent to the Devil Canyon Power Plant and Afterbays of the State Water Project (SWP). The area would contain the Devil Canyon By-Pass Pipeline (see Figure 3, *Devil Canyon Construction Area*, attached).
 - a) *Devil Canyon By-Pass Pipeline*: This proposed pipeline (a 4.5-foot diameter, 110 cfs capacity pipeline) would connect the Foothill Feeder Pipeline to the Lytle Creek Pipeline (also called the Devil Canyon-Azusa Pipeline). This pipeline has two proposed alignments. The northern (shorter) alignment has a length of about 450 feet and connects the Foothill Feeder Pipeline with the Lytle Creek Pipeline. The southern alignment has a length of about 750 feet and is configured identically but with an additional hook-up to the Santa Ana Pipeline (owned and operated by California Department of Water Resources). Both of the proposed alignments are within a previously disturbed corridor that contains the Inland Feeder Pipeline.
- 3) Lower Lytle Creek Construction Area encompasses the alluvial fan area of lower Lytle Creek just north of the City of Rialto. The area would contain the following proposed

facilities: Lower Lytle Creek Pipeline and Local Water Pickup; Cactus Basin Pipeline (see Figure 4, *Lower Lytle Creek Construction Area*, attached).

- a) *Lower Lytle Creek Pipeline*: This proposed pipeline would connect the Lytle Creek Pipeline to the existing Fontana Power Plant outflow canal. As illustrated in Figure 4, the pipeline would originate at the Lytle Creek Pipeline, either at the existing Lytle Creek turnout north east of Riverside Avenue near the northeast boundary of the City of Rialto, or at a new turnout adjacent to Riverside Avenue. From there the pipe would follow a southeasterly route along the northern edge of Riverside Avenue and connect to the existing Fontana Power Plant outflow canal. Water would flow into an existing, 1,200-foot long channel (currently used to convey tailwater from the power plant) that terminates into a series of existing ground water recharge basins.

VEGETATION

Plunge Pool Pipeline: The plunge pool is a circular pool, approximately 25-30 feet in depth. The banks of the pool have been graded to an approximate 2:1 slope and are armored with loose cobble. Immediately downstream of the plunge pool, the main stem of the SAR is a trapezoidal channel and the banks are also lined with loose boulders. This section of the active channel is about 1,500 feet in length, extends from the plunge pool to the Auxiliary Diversion Channel, and varies in width from about 60 feet at the exit of the plunge pool to about 160 feet at the intake of the Auxiliary Diversion Channel.

Along the proposed Plunge Pool Pipeline route, restored/recovering riparian habitat and established riparian habitat are present within the SAR channel from the vicinity of the plunge pool to the Southern California Edison (SCE) power house (SAR 2 and 3). Presently, this section of the channel supports mule fat scrub along its upper part and emergent southern cottonwood-willow riparian woodland and southern willow scrub along its lower portion. The southern willow scrub riparian vegetation is dominated by shrubby willows (including *Salix exigua* and *S. laevigata*) and emergent aquatic vegetation such as cattails (*Typha* sp.). Fremont's cottonwood (*Populus fremontii*) and a few western sycamore (*Platanus racemosa*) trees are also growing among the willows along the channel. The young southern willow scrub community has apparently established since completion of SOD in the late 1990's.

The predominant vegetation in the pipeline corridor north of the SAR channel and along Greenspot Road, as one moves west of the SAR canyon mouth, is characterized as Riversidian alluvial fan sage scrub (RAFSS), with early, intermediate, and mature phases all represented on or in close proximity to the pipeline alignment. Species observed along the pipeline corridor here include low native shrubs that are regarded as pioneer RAFSS species, prevalent following recent

ground disturbance. These include brittlebush (*Encelia farinosa*), California buckwheat (*Eriogonum fasciculatum*), deerweed (*Lotus scoparius*), cudweed-aster (*Lessingia filaginifolia*), sweetbush (*Bebbia juncea*), California sagebrush (*Artemisia californica*), and goldenbush (*Ericameria* sp.). Areas less recently disturbed support most of the above-mentioned pioneer species but also include additional native shrub species such as chamise (*Adenostoma fasciculatum*), sugar bush (*Rhus ovata*), snake cholla (*Opuntia parryi*), our Lord's candle (*Yucca whipplei*), and yerba santa (*Eriodictyon trichocalyx*). Between the shrubs in areas with developed soil, weedy introduced European grasses such as ripgut (*Bromus diandrus*) and foxtail fescue (*Vulpia myuros*) are prevalent, however some patches have few or no weeds and a prevalence of native annual wildflowers such as yellow pincushion (*Chaenactis glabriuscula*). Here and there patches of cryptogamic crust occur characterized by green and black mosses among the pebbles. These patches were relatively weed-free.

Much of western portion of the Plunge Pool Pipeline alignment follows the alignment of the existing 78-inch diameter Foothill Feeder Pipeline, which was installed in 1970. These areas are in an early successional stage and are marked by large rocks, cobbles, and boulders with scattered low shrubs, the most prevalent being brittlebush.

The older terraces adjacent to the disturbed pipeline corridor support a more mature RAFSS community and are dominated by chamise, with scattered redberry (*Rhamnus crocea*), large prickly pear cactus (*Opuntia* sp.), cholla cactus, our Lord's candle, birdsfoot fern (*Pellaea mucronata*) and live-forever (*Dudleya lanceolata*). Occasional large patches of sugarbush and individuals of Mexican elderberry (*Sambucus mexicana*) are scattered throughout the area. Shrub cover and numbers of native plant species are much higher on the older terraces than in the disturbed corridor.

Low Flow Connector: The Low Flow Connector Pipeline would occupy and would traverse the same types of habitats described above for the Plunge Pool Pipeline; principally SAR riverine habitat and areas previously disturbed during construction of SOD. Approximately one ½ mile downstream from the plunge pool, the alignment of the Low Flow Connector Pipeline would diverge from the Plunge Pool Pipeline corridor and turn to the southeast, ultimately connecting to the existing Greenspot pipeline located immediately south of the existing SCE power house (SAR 2 and 3) and the Redlands Aqueduct. To make this connection, the trench and pipeline would cross over areas that were previously disturbed during construction of SOD and an undisturbed side channel adjacent to the existing SCE structures and powerhouse. This side channel supports a mix of sage scrub and chaparral species, as well as

individual mule fat plants, and invasive non-native species such as fountain grass (*Pennisetum setaceum*).

Morton Canyon Connector II: The Morton Canyon Connector II would be constructed at the base of an existing terrace and outside the armored left bank of the SAR in a narrow strip of land that supports degraded RAFSS habitat. This area has been disturbed previously by the construction of the dam, reconstruction of the SAR channel and channel armor, and by the installation of the Morton Canyon Connector I. This area presently supports sage scrub and chaparral species, as well as non-native grasses and ruderal species.

Devil Canyon By-Pass: The proposed Devil Canyon By-Pass site is located on the southern slope of the western San Bernardino Mountains just below the mouth of Devil Canyon. In general, the foothills in this area are mostly undisturbed with development occurring on the alluvial flats south of the foothills. However, within the immediate area of the proposed Devil Canyon By-Pass, severe disturbance has occurred during the installation of a number of major and minor water pipelines that merge in this area as well as many associated structures that occur on the surface. In addition, there are numerous access roads and staging facilities, some of which have been paved.

Plant communities within the area include Riversidian sage scrub, chaparral, southern willow scrub, mulefat scrub, and ruderal grassland. The southern willow scrub occurs along the Devil Canyon channel, which is part of the previously disturbed area. Adjacent to the disturbed area, the channel supports cottonwood (*Populus fremontii*), white alder (*Alnus rhombifolia*), willows (*Salix* spp.), and mule fat (*Baccharis salicifolia*). Most of the upland scrub habitat appears to be the result of revegetation efforts following previous construction. This disturbed Riversidian sage scrub tends to be dominated by a few shrub species, the most prevalent being California sagebrush, brittlebush, California buckwheat, and deerweed. Most of the area within the proposed construction corridor lies within the construction disturbance footprint of a recently completed portion of the Metropolitan Inland Feeder Pipeline.

Lower Lytle Creek Pipeline: The proposed alignment of the Lower Lytle Creek Pipeline is along the northern edge of Riverside Avenue. This major arterial street is close to the southern edge of Lytle Creek Wash near the confluence with Cajon Wash approximately four miles southwest of the proposed Devil Canyon By-Pass site.

The overall vegetation of Lytle Creek Wash is somewhat similar to that on the SAR alluvial fan. Nearly all of the vegetation adjacent to the Lytle Creek channel and spreading basins can be characterized as RAFSS. As described above, the RAFSS

community type can be subdivided by age class. The surrounding habitat is intermediate to mature phase RAFSS. The mature phase RAFSS includes scattered sycamores and includes very large individuals of birchleaf mountain mahogany (up to 35 feet tall). The vegetation in the existing basins is sparse and mostly non-native due to the periodic mechanical clearing of the basins and adjacent berms.

Most of the area that would be disturbed by the project is along Riverside Drive and supports either disturbed RAFSS or no vegetation at all. The existing unlined channel, which currently receives intermittent flows from the Fontana Power Plant, supports a riparian community dominated by native species including mule fat, arroyo willow, sandbar willow, mugwort, goldenrod, annual sunflower, and a variety of grasses and rushes. The basins support a combination of native species including coastal sagebrush, California buckwheat, scalebroom, matchweed, and deerweed along with colonies of weedy non-native species including tocalote, filaree, red brome, ragweed, castor bean, and giant reed. These weedy species are virtually absent from the adjoining RAFSS community, except in the near berms, basins, roads and other disturbed areas.

METHODOLOGY

Protocol (5-night) surveys for the SBKR were conducted by Stephen J. Montgomery. Trapping occurred on the following dates: 26-30 June 2003 and 26-30 August 2003. Trap lines, varying in number of traps, were set out in habitat areas exhibiting characteristics considered to be those most suitable for SBKR (see habitat descriptions above), within the overall Santa Ana River and Lower Lytle Creek proposed project areas. Selected trap sites typically were characterized by openings in otherwise dense stands of scrub and herbaceous vegetation; in some cases, these conditions occurred along dirt roads or trails, or other cleared locations. Traps were baited in the late afternoon, initially checked near midnight, and checked again and closed each following morning by 0800. All captured animals were identified to species and released unharmed at the trap site. Captured SBKR were individually marked by clipping a small area of fur on the hind quarters and then released at the trap site. Sherman standard-sized live traps, modified to eliminate tail loss, were the only type of trap used in the field effort.

RESULTS

Santa Ana River Project Area

A total of 13 localities were trapped during the field effort in this project area (Table 1 and Figure 5, attached). No San Bernardino kangaroo rats were captured. Habitat conditions in most trapped locations in the area were at least superficially suitable for the species. That is, vegetation consists

of alluvial fan sage scrub of varying ages and compositions, or at least exhibits some plant species indicators of this vegetation type. Traps also were set in scrub stands dominated by Riversidian sage scrub that occurred in the near vicinity of at least partial alluvial fan sage scrub habitats. In general, most trapped areas with any RAFSS vegetation appeared to be succeeding to sage scrub conditions, due to their long isolation from flooding. Furthermore, shrub (and usually herb) density was high in most trapped areas, again due to their long isolation from flooding. Such conditions greatly reduced the likelihood of SBKR. Soils throughout the area generally consist of various types of sands, all of which are generally suitable for SBKR. A single night of trapping using 15 Sherman traps in known occupied habitat immediately adjacent to the general project area produced one adult SBKR (see Trap Site 9 in Table 1 and Figure 5, attached). This trap site served as a "control" to validate the negative results obtained at the various nearby project area trap locations.

Devil Canyon Project Area

Large-sized kangaroo rat fecal deposits (scat) were observed at the edge of the eastern portion of the Devil Canyon proposed project site (Figure 3, attached). Since the SBKR typically deposits scat visibly smaller than that of the un-listed DKR, it is relatively certain that SBKR are absent at this locality. However, future trapping of this site would be required to confirm this preliminary assessment. No SBKR have been reported from the immediate vicinity of this locality. Furthermore, shrub cover in this area was generally very dense prior to recent pipeline construction activities, which is typical of habitat occupied by DKR and atypical of SBKR occupied habitat.

Lower Lytle Creek Project Area

Trap lines were established both within the settling basins and in scrub stands adjacent to the basins. Trapping occurred in scrub habitats adjacent to the basins in order to determine the presence/absence of SBKR in the immediate vicinity of the basins. In general, the basins themselves are unvegetated and very rocky, and therefore constitute poor quality habitat for SBKR. However, habitat conditions in the scrub habitats immediately surrounding the Lytle Creek project area are generally suitable for SBKR, although shrub and herb density in most locations is high and therefore minimally suitable for the species. Most of the settling basins and adjacent habitats occur a considerable distance from the very open habitats of the Lytle Creek wash, which exhibits very high quality open SBKR habitat and therefore the highest likelihood of SBKR occurrence.

A total of eight localities were trapped during the field effort in this project area (Table 2 and Figure 6, attached). Five individual SBKR were captured at two localities in this general project area. Four SBKR were readily captured (night 2) in the sandy, open RAFSS habitats along the edge of the Lytle Creek wash (Trap Site D in Table 2 and Figure 6). A single SBKR was captured on the fifth night at trap site F. The specific location yielding the single SBKR at Site F, at which three traps were set, was minimally vegetated, unlike the remainder of this trap line which occurred in relatively dense

Mr. Daniel Marquez
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RAFSS cover. Trap site F occurred approximately ½ mile from the high-quality habitat at the edge of Lytle Creek wash where four individual SBKR were captured at Trap Site D. The un-listed DKR was commonly captured in all trap lines in this project area, including that producing four SBKR (Line D).

The capture of a single SBKR at Site F, and the absence of captures in other intervening or nearby trap lines, suggests that this species occurs at very low densities in most of the denser scrub habitats within the Lower Lytle Creek project area. In contrast, the more open habitats at and near the edge of Lytle Creek exhibit higher densities of this species. Therefore, very intensive trapping in all scrub habitat stands surrounding the basins in the Lower Lytle Creek project area would likely yield a few additional SBKR.

Should you have any questions regarding the methodology or findings in this report, please do not hesitate to contact the undersigned at (858) 484-9100 or by e-mail at sjmbioconsult@san.rr.com.

Sincerely,

Stephen J. Montgomery
SJM Biological Consultants
Permitted San Bernardino Kangaroo Rat Biologist

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Table 1. Santa Ana River Project Area Trapping Results

Trap Line Number	Date Traps Checked	Number of Traps Set	Animals Captured*						
			SBKR	DKR	SDPM	CM	DM	SDW	WHM
1	26-Jun-03	107	0	0	3	0	3	0	0
1	27-Jun-03	107	0	0	5	0	6	1	0
1	28-Jun-03	107	0	0	5	0	4	0	0
1	29-Jun-03	107	0	0	4	0	1	0	0
1	30-Jun-03	107	0	0	4	0	2	0	0
2	26-Jun-03	75	0	1	0	0	5	0	0
2	27-Jun-03	75	0	1	10	0	3	0	0
2	28-Jun-03	75	0	0	7	0	4	0	0
2	29-Jun-03	75	0	0	11	0	3	0	0
2	30-Jun-03	75	0	0	6	0	5	0	0
3	26-Jun-03	60	0	0	3	0	4	0	1
3	27-Jun-03	60	0	0	7	1	8	0	1
3	28-Jun-03	60	0	0	12	1	7	0	0
3	29-Jun-03	60	0	0	10	2	10	0	0
3	30-Jun-03	60	0	0	9	2	7	0	0
4	26-Jun-03	55	0	0	9	0	3	0	0
4	27-Jun-03	55	0	0	9	1	9	0	1
4	28-Jun-03	55	0	0	12	1	8	0	0
4	29-Jun-03	55	0	0	15	0	7	0	0
4	30-Jun-03	55	0	0	7	0	4	0	0
5	26-Jun-03	45	0	0	3	1	3	3	0
5	27-Jun-03	45	0	0	7	0	5	1	0
5	28-Jun-03	45	0	0	7	1	7	1	0
5	29-Jun-03	45	0	0	7	0	6	0	0
5	30-Jun-03	45	0	0	6	0	5	0	0
6	26-Jun-03	35	0	0	3	0	2	0	0
6	27-Jun-03	35	0	0	10	0	2	0	0
6	28-Jun-03	35	0	0	7	0	8	1	0
6	29-Jun-03	35	0	0	3	1	4	1	0
6	30-Jun-03	35	0	0	6	1	2	0	0
7	26-Jun-03	20	0	0	0	0	0	0	0
7	27-Jun-03	20	0	0	3	0	4	0	0
7	28-Jun-03	20	0	0	2	1	4	0	0
7	29-Jun-03	20	0	0	6	1	9	0	0
7	30-Jun-03	20	0	0	3	0	3	0	0
8	26-Jun-03	20	0	0	0	0	0	0	0
8	27-Jun-03	20	0	1	5	0	4	0	0
8	28-Jun-03	20	0	2	3	0	5	0	0
8	29-Jun-03	20	0	1	6	0	5	0	0
8	30-Jun-03	20	0	0	4	0	3	0	0
9	29-Jun-03	15	1	0	2	1	0	0	0
10	26-Aug-03	50	0	0	12	1	9	2	0

Table 1 (continued). Santa Ana River Project Area Trapping Results

Trap Line Number	Date Traps Checked	Number of Traps Set	Animals Captured*						
			SBKR	DKR	SDPM	CM	DM	SDW	WHM
10	27-Aug-03	50	0	0	15	1	6	1	0
10	28-Aug-03	50	0	0	15	2	9	1	0
10	29-Aug-03	50	0	0	21	2	3	0	0
10	30-Aug-03	50	0	0	12	1	6	0	0
11	26-Aug-03	50	0	0	14	2	1	0	0
11	27-Aug-03	50	0	0	15	1	2	1	0
11	28-Aug-03	50	0	0	14	0	2	0	0
11	29-Aug-03	50	0	0	13	0	4	0	0
11	30-Aug-03	50	0	0	12	1	2	0	0
12	26-Aug-03	50	0	0	16	2	6	0	0
12	27-Aug-03	50	0	0	15	1	6	0	0
12	28-Aug-03	50	0	0	14	2	6	0	0
12	29-Aug-03	50	0	0	18	1	11	0	0
12	30-Aug-03	50	0	0	13	1	8	0	0
13	26-Aug-03	50	0	0	14	0	7	0	2
13	27-Aug-03	50	0	0	15	0	11	1	0
13	28-Aug-03	50	0	0	10	0	7	1	0
13	29-Aug-03	50	0	0	15	0	8	1	0
13	30-Aug-03	50	0	0	12	0	6	1	0
TOTAL	-----	3100	1	6	526	33	304	17	5

SBKR= San Bernardino kangaroo rat (*Dipodomys merriami parvus*)
DKR= Dulzura kangaroo rat (*Dipodomys simulans*)
SDPM= northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*)
CM= cactus mouse (*Peromyscus eremicus*)
DM= deer mouse (*Peromyscus maniculatus*)
SDW= San Diego desert woodrat (*Neotoma lepida intermedia*)

*Animals Captured: Only San Bernardino kangaroo rats were marked and therefore precisely enumerated. The recorded number of individuals of other species do not accurately reflect the number of different individuals captured at each site.

Table 2. Lower Lytle Creek Project Area Trapping Results

Trap Line Number	Date Traps Checked	Number of Traps Set	Animals Captured*						
			SBKR	DKR	SDPM	CAM	CM	DM	SDW
A	26-Aug-03	40	0	4	4	0	2	2	0
A	27-Aug-03	40	0	1	6	0	2	3	0
A	28-Aug-03	40	0	3	8	0	0	1	0
A	29-Aug-03	40	0	2	9	0	0	3	0
A	30-Aug-03	40	0	0	8	0	2	3	1
B	26-Aug-03	30	0	1	4	0	0	0	0
B	27-Aug-03	30	0	0	0	0	0	0	0
B	28-Aug-03	30	0	3	18	0	0	0	3
B	29-Aug-03	30	0	4	11	0	0	2	0
B	30-Aug-03	30	0	2	7	0	0	3	0
C	26-Aug-03	25	0	0	3	0	0	2	1
C	27-Aug-03	25	0	3	11	0	0	5	1
C	28-Aug-03	25	0	1	1	0	0	1	0
C	29-Aug-03	25	0	1	7	0	0	2	0
C	30-Aug-03	25	0	1	4	0	0	2	0
D	26-Aug-03	61	0	1	0	0	0	0	0
D	27-Aug-03	61	4	4	4	0	0	3	0
D	28-Aug-03	61	0	4	7	0	0	1	1
D	29-Aug-03	61	0	2	13	0	0	0	1
D	30-Aug-03	61	0	3	10	0	0	3	1
E	26-Aug-03	38	0	0	0	0	0	0	0
E	27-Aug-03	38	0	6	0	0	0	0	0
E	28-Aug-03	38	0	11	2	0	0	5	0
E	29-Aug-03	38	0	9	7	0	0	5	0
E	30-Aug-03	38	0	8	8	0	0	2	0
F	26-Aug-03	25	0	0	0	0	0	0	0
F	27-Aug-03	25	0	0	4	0	3	1	0
F	28-Aug-03	25	0	0	9	0	3	4	1
F	29-Aug-03	25	0	1	7	0	3	2	0
F	30-Aug-03	25	1	7	5	0	0	3	0
G	26-Aug-03	25	0	0	0	0	0	0	0
G	27-Aug-03	25	0	2	0	0	0	0	0
G	28-Aug-03	25	0	4	1	0	0	2	0
G	29-Aug-03	25	0	4	5	0	0	1	0
G	30-Aug-03	25	0	3	5	0	0	1	0
H	26-Aug-03	24	0	0	0	0	0	0	0
H	27-Aug-03	24	0	0	0	0	0	0	0
H	28-Aug-03	24	0	0	0	0	0	0	0

Trap Line Number	Date Traps Checked	Number of Traps Set	Animals Captured*						
			SBKR	DKR	SDPM	CAM	CM	DM	SDW
H	29-Aug-03	24	0	0	0	0	0	0	0
H	30-Aug-03	24	0	7	6	1	0	2	0
TOTAL	-----	1340	5	102	194	1	15	64	10

SBKR= San Bernardino kangaroo rat (*Dipodomys merriami parous*)
DKR= Dulzura kangaroo rat (*Dipodomys simulans*)
SDPM= Northwestern San Diego pocket mouse (*Chaetodipus fallax fallax*)
CAM= California Mouse (*Peromyscus californicus*)
CM= Cactus Mouse (*Peromyscus eremicus*)
DM= Deer Mouse (*Peromyscus maniculatus*)
SDW= San Diego Desert Woodrat (*Neotoma lepida intermedia*)

*Animals Captured: Only San Bernardino kangaroo rats were marked and therefore precisely enumerated. The recorded number of individuals of other species do not accurately reflect the number of different individuals captured at each site.

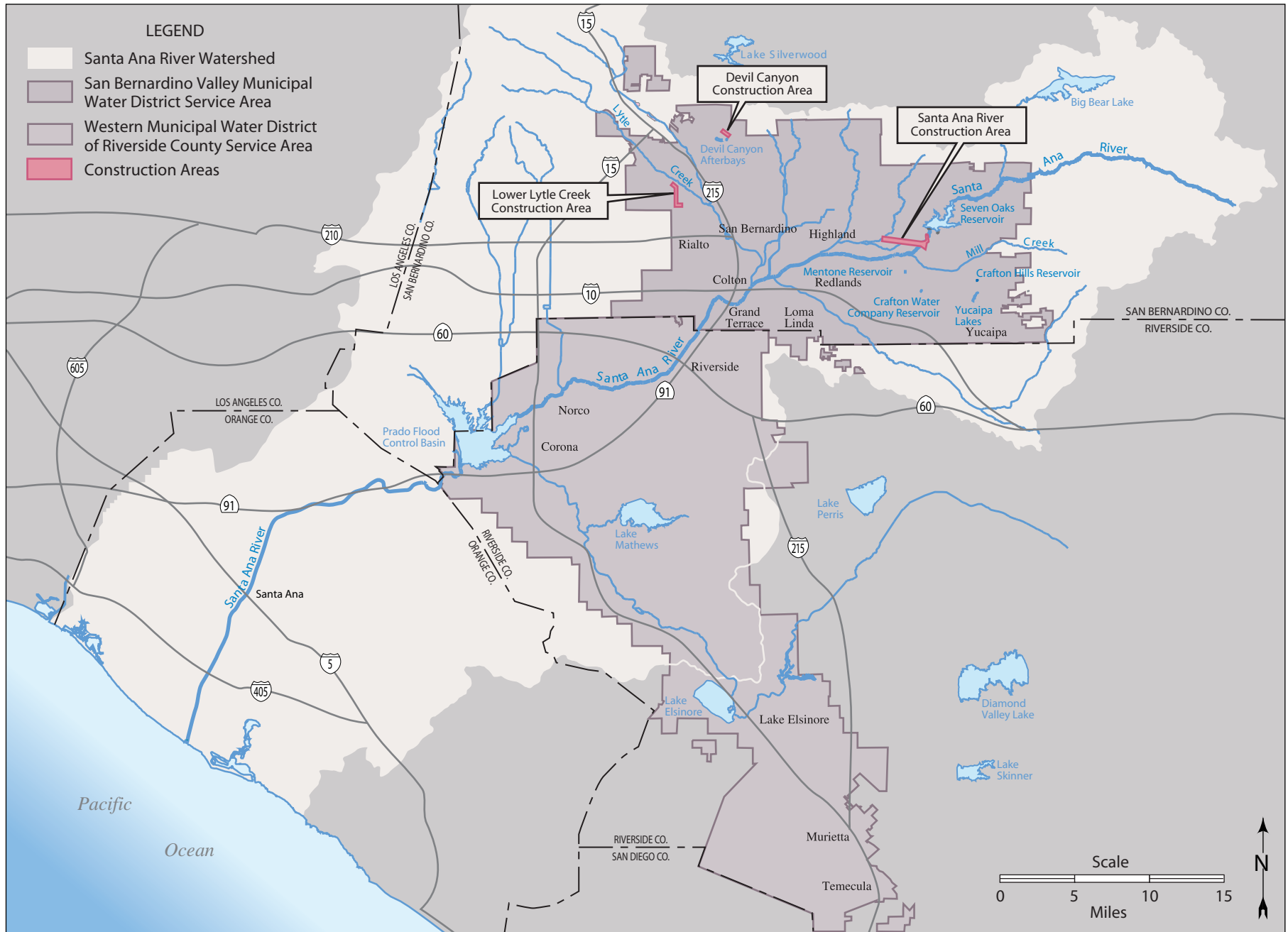


Figure 1. General Locations of Construction Areas

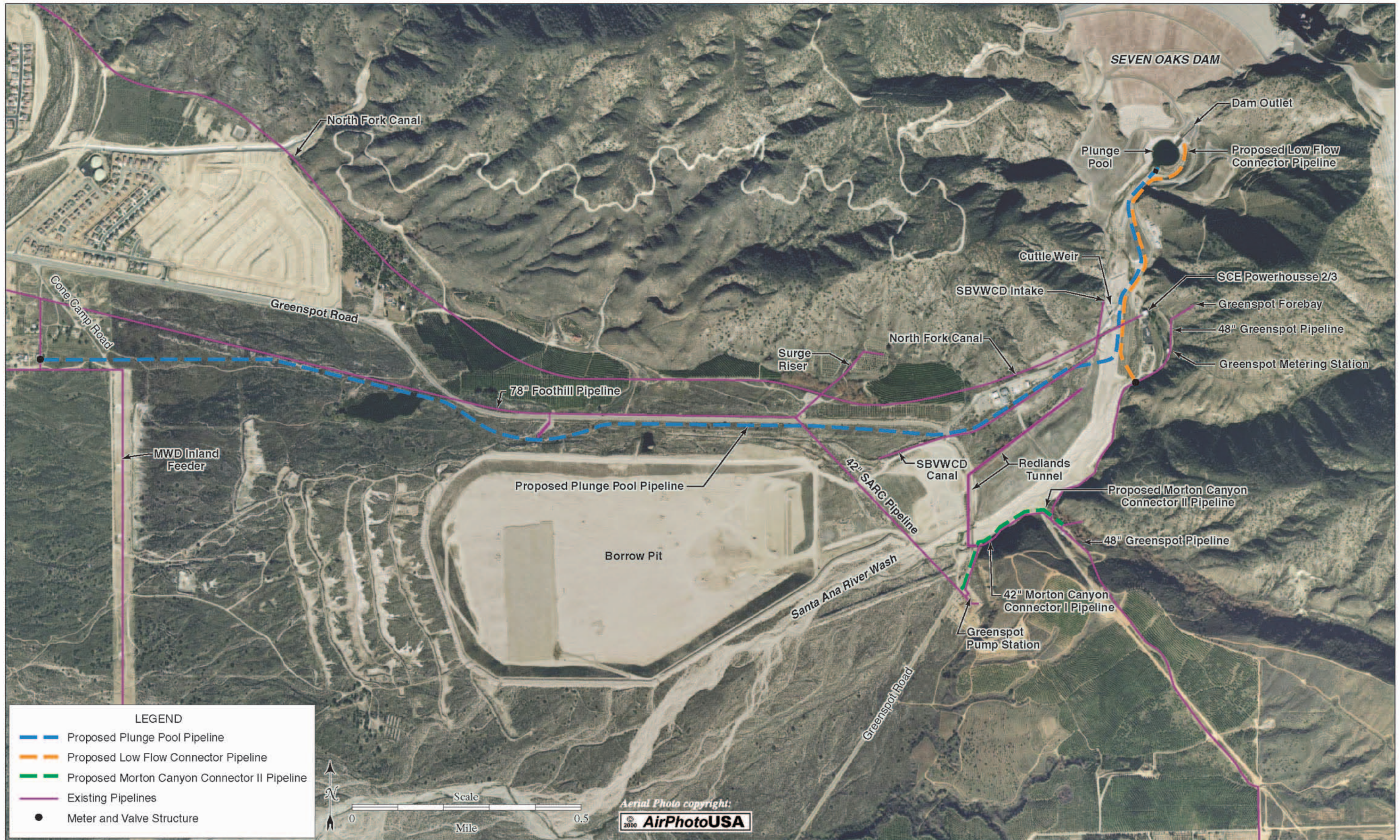


Figure 2. Santa Ana River Construction Area

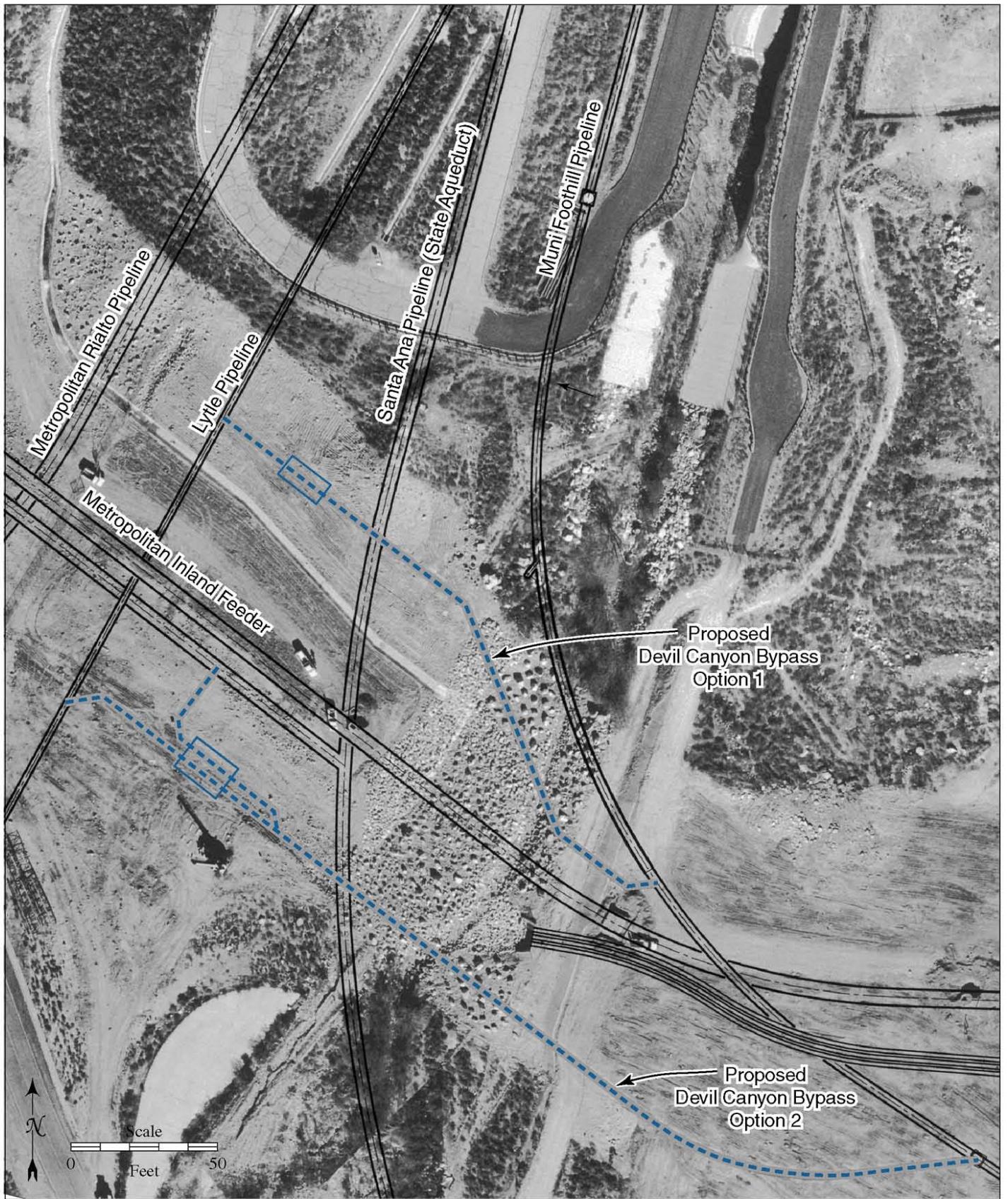


Figure 3. Devil Canyon Construction Area

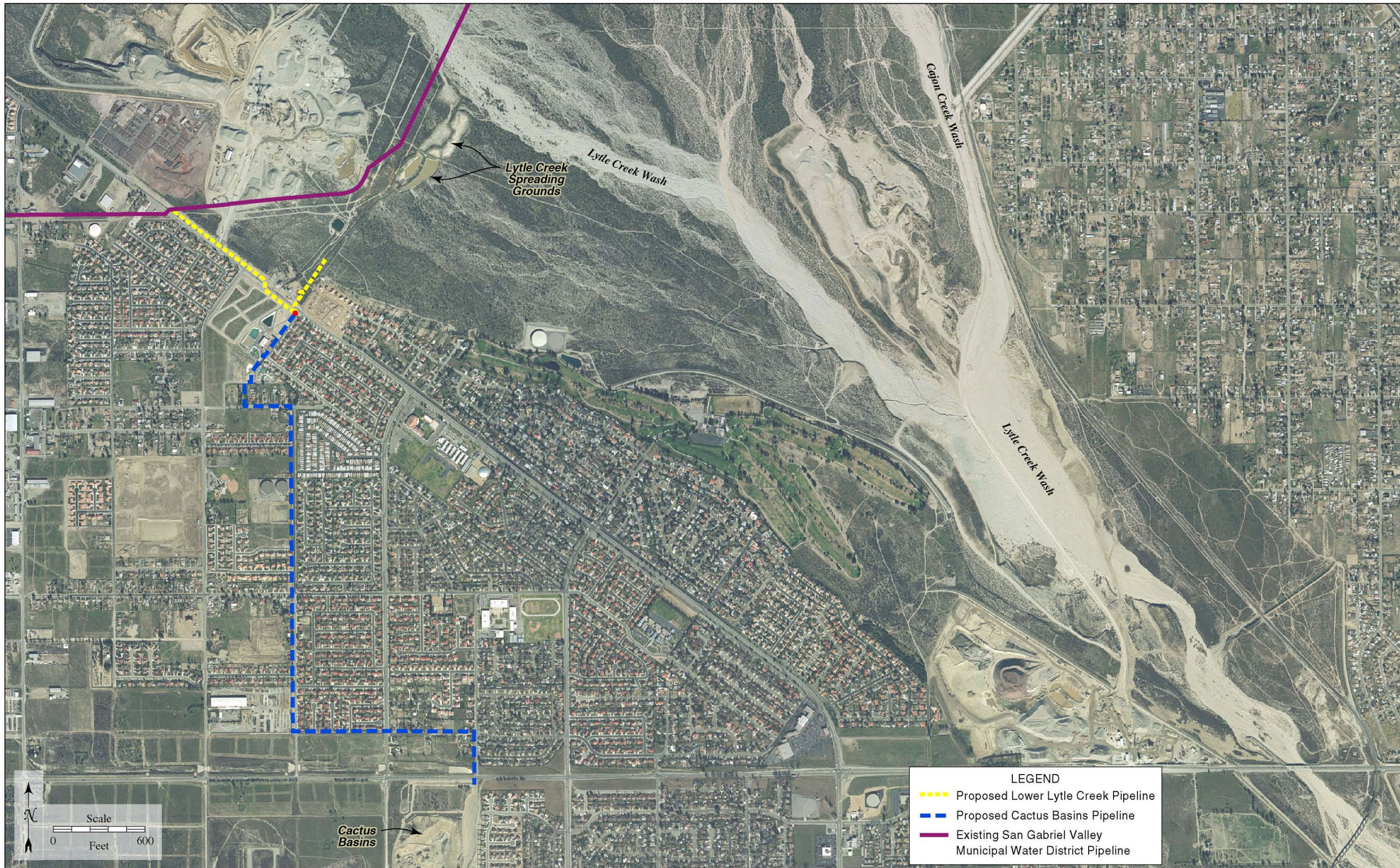


Figure 4. Lower Lytle Creek Construction Area

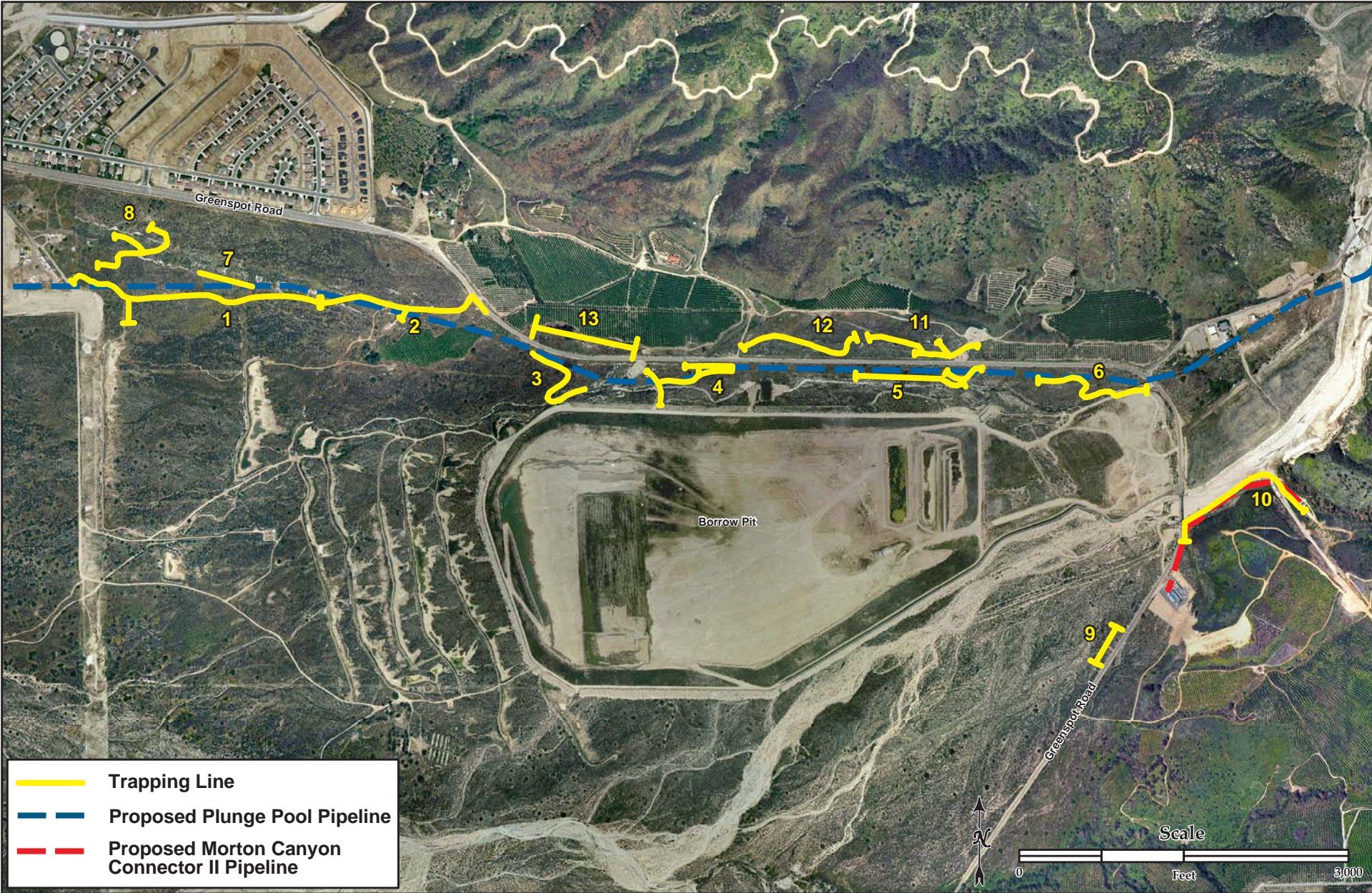


Figure 5. Santa Ana River Construction Area, SBKR Trapping Line Locations

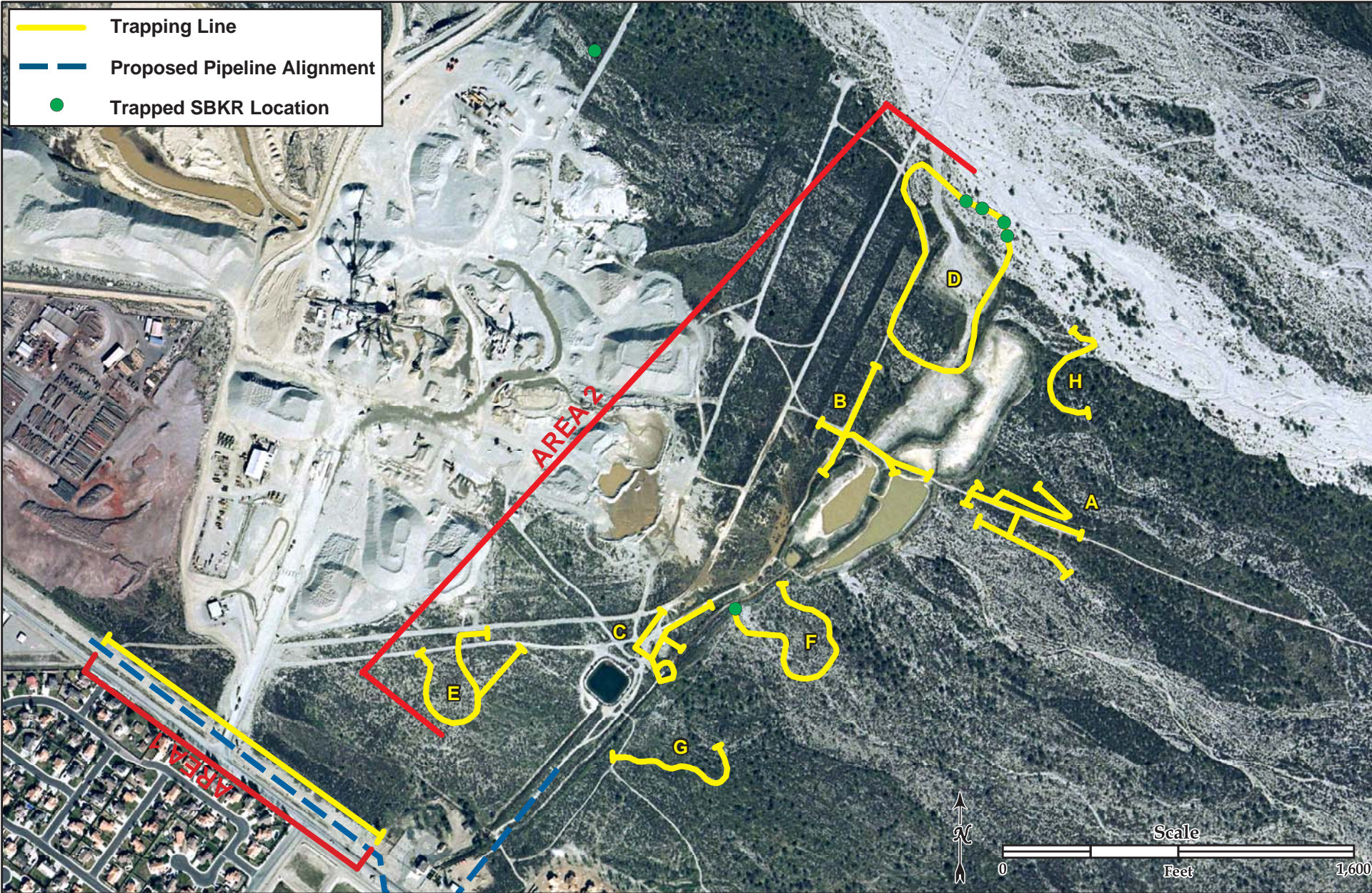


Figure 6. Lower Lytle Creek Construction Area, SBKR Trapping Line Locations

1 E3: VEGETATION AND RARE PLANT SURVEY

2 *Introduction*

3 SAIC biologists conducted three separate field surveys within the Project area in 2003 for the
4 purpose of documenting vegetation and to search for sensitive plant species. The surveys were
5 conducted March 25-27, May 13 -14, and June 11-12. The timing of the surveys was chosen to
6 accommodate the peak flowering times of the target species. The surveys were conducted in
7 the Santa Ana River, Devil Canyon, and Lytle Creek areas and encompassed all proposed
8 construction areas associated with the Project.

9 *Methodology*

10 Background research was conducted prior to the field surveys, including a search for sensitive
11 plant species using the Department of Fish and Game's California Natural Diversity Database
12 (CNDDDB) and a variety of published reports pertaining to the project area. This search
13 identified sensitive species with the potential to occur within the project area. These were
14 targeted in preparation for the rare plant surveys.

15 Included on this list are two federally or state-listed rare, threatened, or endangered species
16 judged to have high potential to occur in the project area, slender-horned spineflower
17 (*Dodecahema leptoceras*) and Santa Ana River woolly star (*Eriastrum densifolium* ssp. *sanctorum*).
18 Slender-horned spineflower is federally and state-listed as endangered, and is listed on the
19 California Native Plant Society's (CNPS) List 1B (plants rare and endangered in California and
20 elsewhere). It is an annual herb that blooms from April to June and is found on sandy soils.
21 One occurrence of this species was recorded within the SAR fan one mile south of Greenspot
22 Road and 0.5 miles east of the old railroad grade. Santa Ana River woolly star is also federally
23 and state listed as endangered, and on CNPS List 1B. It ranges in habit from perennial herb to
24 subshrub, blooms from June to September, and is found on sandy or gravelly soils. Its erect
25 habit, stature, and silvery foliage make it conspicuous even when not in flower. Populations of
26 this species have been observed within the Santa Ana River wash and the floodplain, and the
27 species was considered likely to occur within the project area in the alluvial fan sage scrub.
28 Prior to the field work, background information was gathered from reference materials with
29 particular emphasis on field identification of the target sensitive plant species.

30 Prior to the start of the March, May, and June surveys, participating biologists visited known
31 locations of the slender-horned spineflower, Santa Ana River woolly star, and Parry's
32 spineflower (*Chorizanthe parryi* var. *parryi*), a CNPS list 3 species, to verify the appearance and
33 condition of these species on the survey dates.

34 A 400-foot corridor centered on proposed project alignments was plotted on aerial photographs
35 and used as the survey area for the focused sensitive plant surveys. During the March and May
36 survey dates, four biologists walked meandering transects parallel to each other approximately
37 seventy five feet apart for the length of the survey corridor. Each person walked in a
38 meandering (side to side) fashion to ensure thorough coverage of the survey area. Locations of
39 sensitive species were recorded on air photos and coordinates recorded using GPS. The June
40 surveys were conducted by two biologists.

1 Surveys were conducted along the length of the Plunge Pool Pipeline area in the Santa Ana
2 River (parallel to Greenspot Road and up to the Seven Oaks Dam), as well as the proposed
3 Morton Canyon connector, Lytle Creek and Devil Canyon project areas. Materials taken into
4 the field included aerial photographs, reference manuals, project plans, a dissecting scope and
5 GPS units. The aerial photographs were used to record the plant community types within and
6 adjacent to the survey corridors. The field maps were later used to develop vegetation maps
7 included in the EIR. In addition to classification of the vegetation, other notes and labels on
8 habitat and/or specific features recorded on the aerial photographs during the surveys were
9 also included on the maps as appropriate.

10 Plant species observed during the surveys were generally identified to species. In the case of
11 genera containing rare or sensitive plants that might be present, identification was to species,
12 subspecies, or variety as needed. Plant identification was done with the aid of a binocular zoom
13 dissecting scope with a 7X to 30X range of magnification.

14 *Results and Discussion*

15 Plant community types and sensitive species locations identified during the surveys are
16 identified in EIR Figure 3.3-4.

17 Plant communities identified in the survey areas include mulefat scrub, southern cottonwood-
18 willow riparian woodland (both restored and degraded), sycamore woodland, Riversidian sage
19 scrub, Riversidian alluvial fan sage scrub, and mixed chaparral. Each habitat category was
20 identified and mapped on the aerial photographs.

21 Four sub-categories of Riversidian Alluvial Fan Sage Scrub (RAFSS) were recognized and
22 mapped reflecting the condition or developmental (seral) state of this plant community as
23 follows:

24 *Degraded:* Areas identified as degraded RAFSS were dominated by California sagebrush
25 with buckwheat and scalebroom common. In some areas, such as adjacent to the
26 housing development along the Lytle Creek route (subsequently deleted from the
27 project) and along the north side of Greenspot Road, the plant community has lower
28 cover of shrubs and greater cover of non-native grasses and annual species as well as
29 evidence of disturbance such as piles of debris and fill.

30 *Intermediate:* Intermediate RAFSS is dominated by buckwheat with brittlebush,
31 scalebroom, chamise, and yerba santa common. Large individuals of sugarbush were
32 present in some areas. Shrub cover is open with annuals present in open areas. Most of
33 the observed occurrences of Parry's spineflower (10 to 50 or more plants per colony)
34 were associated with this phase of RAFSS. These colonies were typically found in
35 shrub-free openings with other low-growing native annuals and patches of cryptogamic
36 soil crust. There are also patches of dense introduced annual grasses and tall native
37 annual species where low growing annuals, such as spineflowers, were not found.

38 *Mature:* Mature RAFSS consists of mountain mahogany, holly-leaved cherry, chamise,
39 chaparral yucca, squawbush as well as shrubs typical of the intermediate phase
40 including buckwheat, brittlebush, scalebroom, chamise, and yerba santa as well as an

1 occasional juniper and occasional stunted sycamores. Understory consists of a wide
2 variety of primarily native annual forbs and non-native annual grasses. This type was
3 recognized only in a portion of the Lytle Creek area subsequently deleted from the
4 project, where it was extensive. Patches of cryptogamic crust were common on finely
5 textured soils within this community, which was also marked by extensive flood related
6 alignments of small boulders and large cobbles.

7 *Pipeline Disturbance:* This category was used to refer to the RAFSS plant community that
8 developed in an area disturbed by installation of the Foothill Feeder Pipeline in about
9 1970 within the proposed project alignment parallel to Greenspot Road. It is similar to
10 the Intermediate-phase RAFSS identified above except that vegetation was considerably
11 sparser and large patches of boulders and cobbles were present with very little
12 associated vegetation. Deerweed and corethrogyne, both short-lived native perennials,
13 were relatively common in this area in addition to buckwheat, brittlebush, scalebroom,
14 and yerba santa. Patches of cryptogamic crust were present and a few small occurrences
15 of Parry's spineflower were noted.

16 No state or federally listed threatened or endangered plant species were observed during initial
17 biological surveys conducted in the area in June 2001 nor during focused biological surveys
18 conducted for the project in April, May, and June 2003. Based on the results of these surveys, it
19 is concluded that the slender-horned spineflower and Santa Ana River woolly star were not
20 present in the surveyed areas during the survey period and probably do not occur there under
21 existing conditions. Although the overall habitat characteristics appeared to be generally
22 suitable for these species, the specific edaphic (soil) conditions characteristically associated with
23 other populations of these species were not present in the surveyed areas.

24 About 25 individuals of Plummer's mariposa lily (*Calochortus plummerae*) were identified from
25 seven locations along the proposed Plunge Pool Pipeline corridor during June 2003 (EIR Figure
26 3.3-4). Plummer's mariposa lily is a CNPS List 1B species (=rare and endangered in California
27 and elsewhere). Localized occurrences of Parry's spineflower containing tens to hundreds of
28 individuals were prevalent along the western portions of the proposed Plunge Pool Pipeline
29 corridor (see EIR Figure 3.3-4). Numerous locations were marked and their coordinates
30 recorded with GPS (see EIR Figure 3.3-4). The distribution of this species was closely associated
31 with areas of cryptogamic soil in openings between shrubs. Competing non-native grasses
32 were sparse and other low-growing native annuals were typically present. Some of the locations
33 where Parry's spineflower were found were within the area previously disturbed by installation
34 of the Foothill Pipeline in 1970. This species was also locally abundant along portions of the
35 Lytle Creek area subsequently deleted from the project. Parry's spineflower is a CNPS List 3
36 species (=need more information to assign status – a review list).

37 The 2003 growing season produced an exceptional growth of native wildflowers in the project
38 area and elsewhere in southern California. Cool conditions and a series of late-season rain
39 showers helped prolong the growth and development of many native species. Plants were
40 robust and readily identifiable in reference populations of slender-horned spineflower, Santa
41 Ana River woolly star, and Parry's spineflower. The timing of the April visit was before the
42 peak of flowering of the spineflowers, but they were nevertheless identifiable during that visit.
43 The May survey coincided with profuse flowering of both spineflower species, which made

1 these small plants conspicuous. These plants were still evident during the June visit.
2 Plummer's mariposa lily was conspicuously in flower during the June visit but not observed
3 during prior visits. The Santa Ana River woolly-star was evident during each site visit due to its
4 erect growth habit, stature, and conspicuous foliage. It had conspicuous inflorescences during
5 the June visit.

1 **E4: ADDITIONAL INFORMATION ON KEY RESOURCES**

2 Below is additional information pertaining to the following key resources: (1) Riversidian
3 alluvial fan sage scrub; (2) Parry's spineflower; (3) Santa Ana River woolly-star; (4) San
4 Bernardino kangaroo rat; (5) California gnatcatcher; and (6) Santa Ana sucker.

5 **1. Riversidian Alluvial Fan Sage Scrub (RAFSS)**

6 RAFSS is a habitat type characteristically dominated by a distinctive assemblage of shrubs and
7 subshrubs characteristic of both coastal sage scrub and chaparral communities. RAFSS is found
8 only on the upper portions of alluvial fans fringing the interior of the Los Angeles Basin. From
9 east to west, the major remaining areas of RAFSS habitat type are along the San Jacinto River
10 near Hemet, in the upper Santa Ana River drainage (near Seven Oaks Dam), near the
11 confluence of Cajon and Lytle Creeks, the vicinity of Etiwanda and Cucamonga creeks (above
12 Rancho Cucamonga), San Antonio Creek (near Claremont and Upland), the San Gabriel River
13 (near Azusa), and Big Tujunga Wash (near Sunland). RAFSS habitats have also been referred to
14 as Alluvial Fan Sage Scrub (cf. Hanes, et al. 1989) and Alluvial Scrub vegetation (Smith 1980).
15 Tiny remnants also occur in the vicinity of Monrovia and Pasadena.

16 Much of this habitat was originally converted to agricultural uses early in the twentieth century
17 (such as citrus groves) and has subsequently been converted to residential and commercial
18 development. Sand and gravel mining, groundwater-recharge facilities, well fields, and flood
19 control structures and habitat modifications are prevalent in and around remaining areas of this
20 habitat.

21 Remnant stands are threatened by exotic species invasion, illegal dumping of refuse, off-road
22 vehicular activity, intensification or expansion of existing neighboring land uses, and other
23 human activities.

24 This habitat type is limited to flood-deposited alluvial soils and is not present on adjacent
25 hillsides, although some of the dominant plant species are also found in coastal sage scrub or
26 chaparral communities on hillsides.

27 Many of the sensitive species associated with RAFSS are largely or entirely restricted to the
28 alluvial fans. These include San Bernardino kangaroo rat (SBKR), Santa Ana River woolly star,
29 slender-horned spineflower, and Parry's spineflower and are considered separately.

30 Heterogeneity is a hallmark of the RAFSS habitat type. The dominant vegetation and soils can
31 vary considerably over short distances as a result of flood frequency and time since last flood;
32 variation in nature of flood-deposited materials; and water availability. Kirkpatrick and
33 Hutchinson (1978) identify high species diversity and unrivalled structural complexity as
34 characteristics of the coastal scrub community developed on fans and washes in cismontane
35 southern California. The structural complexity is the result of co-occurrence of plants having a
36 variety of growth forms, ranging from large woody evergreen shrubs or small trees to small
37 and medium sized drought-deciduous shrubs, annual and perennial wildflowers, climbing
38 vines, cacti, and large rosette-plants such as chaparral yucca. The open spaces between the
39 shrubs support a wide variety of low to tall annual and herbaceous perennial wildflowers in the

1 springtime, including many plants not found in chaparral communities (Hanes 1976; Hanes et
2 al. 1989). This diversity in growth form is not found in either chaparral or coastal sage scrub
3 communities, which ordinarily do not mix (Minnich, 1976).

4 A 610-acre conservation bank for alluvial fan scrub has been established in the Lytle/Cajon
5 Creek area (CDFG 2003 b; USFWS, 2000). According to USFWS (2000) this bank, when fully
6 purchased would be combined with two other areas of mitigation lands in Lytle Creek-Cajon
7 Wash area to form a 1,400-acre preservation area that could serve as a nucleus for an even larger
8 reserve to protect listed species within the Lytle Creek Cajon-Wash area (USFWS 2000).

9 We are not aware of mitigation banks in the Santa Ana River drainage, however, two areas that
10 include alluvial fan sage scrub have been set aside for conservation of endangered plant species.
11 In 1988, the Corps of Engineers and three flood control districts established the 764-acre Woolly
12 star preservation area on the Santa Ana River floodplain, concentrated near the low-flow
13 channel. In 1994, the Bureau of Land Management designated three parcels in the Santa Ana
14 River, a total of 760 acres, as an Area of Critical Environmental Concern (ACEC). The primary
15 goal in designation of the ACEC was to protect and enhance the habitat of federally listed plant
16 species occurring in the area, while providing for the administration of existing valid rights
17 (USFWS 2000). Both of these areas contain alluvial fan scrub vegetation, mostly in the early and
18 intermediate phases.

19 On the Santa Ana River alluvial fan below Seven Oaks Dam, the Army Corps of Engineers
20 (ACOE 1996) mapped the different phases of Riversidian Alluvial Fan Sage Scrub as follows:

Early Phase	1,131
Intermediate Phase	1,240
Mature Phase w/juniper	1,023
Mature Phase w/chamise	685

21 Most of the habitat traversed by the Plunge Pool Pipeline would be classified as intermediate
22 phase or is transitional to a mature phase with chamise. Where chamise is present it does not
23 form a dense cover. There are large individuals of sugar bush (*Rhus ovata*) scattered here and
24 there, otherwise the vegetation is dominated by drought-deciduous shrubs [brittlebush (*Encelia*
25 *farinosa*), yerba santa (*Eriodictyon trichocalyx*), California buckwheat (*Eriogonum fasciculatum*),
26 wishbone bush (*Mirabilis californica*) and cacti [snake cholla (*Opuntia parryi*) and prickly pear
27 (*Opuntia littoralis*)]. Evidence of past fire in the form of charred wood (bases of chamise stems)
28 was present.

29 There is no adopted impact significance threshold for RAFSS recognized by the County, State,
30 or Federal Government. The California Department of Fish and Game's current global and state
31 rank for Riversidian Alluvial Fan Sage Scrub is G1, S1.1; this is the rarest and most endangered
32 rank they have (CDFG 2003a). CDFG recommends 3:1 mitigation for impacts to RAFSS in San
33 Bernardino County.

2. Parry's Spineflower (*Chorizanthe parryi* var. *parryi*)

Parry's spineflower (also known as San Bernardino spineflower) is known only from scattered populations fringing the Los Angeles Basin in Los Angeles, San Bernardino and Riverside counties, California. According to the botanical authority on the buckwheat family, much of the native habit of Parry's spineflower has been destroyed by development in the twentieth century (Reveal, 2001).

Parry's spineflower is closely associated with Riversidian Alluvial Fan Sage Scrub (RAFSS), a vegetation and habitat type found only on the upper portions of alluvial fans fringing the Los Angeles Basin as described in the preceding section. Much of this habitat was originally converted to agricultural uses (such as citrus groves) early in the century and has subsequently been converted to residential and commercial development. Sand and gravel mining, groundwater-recharge facilities, well fields, and flood control structures and activities are prevalent in and around remaining areas of this habitat. Populations of Parry's spineflower are also affected by exotic species invasion, illegal dumping of refuse, off-road vehicular activity, intensification or expansion of existing neighboring land uses, and other human activities.

Parry's spineflower is principally found in flood-deposited alluvial soils but may also be present on adjacent hillsides or hilltops with sandy soil. Judging from its occurrences in alluvial fan areas surveyed for this project in the Lytle Creek and Santa Ana River areas, it is associated with openings in the shrubby vegetation that support low-growing annual plant species such as *Lastarriaea coriacea* and *Pectocarya penicillata*. Cryptogamic soil crusts (soil stabilizing crusts formed by non-flowering plants such as mosses, lichens, and blue-green algae) are typically present and weedy grasses are sparse or absent. Parry's spineflower is scarce or absent from areas dominated by taller native annuals (e.g., *Phacelia distans*) or introduced grasses.

Although Parry's spineflower is generally associated with "undisturbed" habitat, in two instances during surveys for this project it was found on previously disturbed sites. At these sites, physical disturbances several to many years ago evidently had the effect of suppressing the growth of taller competing vegetation. These sites included small patches of the spineflower along the centerline of the Foothill Pipeline, installed in about 1970. At this site, cryptogamic soil crusts had also developed to some extent in the years subsequent to the disturbance. Parry's spineflower was also found to be abundant on a short section of a previously bladed road, where the soil appeared to have been scalped and compacted and competing vegetation was quite low and sparse. Neither site had dense growths of non-native annual grasses or other invasive exotic plant species.

In the most recent California Native Plant Society Inventory (CNPS 2001), Parry's spineflower is included on List 3, a review list, with the suggestion that it possibly should be moved to List 1B (Plants Rare, Threatened, or Endangered in California and Elsewhere). Approximately 116 locations of Parry's spineflower were mapped along the Plunge Pool Pipeline corridor. These ranged in size from a few individuals to hundreds of individuals. The fraction of remaining RAFSS habitat that is occupied by this species is unknown but is believed to be a small fraction of the total remaining RAFSS habitat. For example Parry's spineflower was not found at all in a large site of mature Juniper-dominated RAFSS used as a reference site for slender-horned spineflower (*Dodecahema leptoceras*) or in a pioneer to intermediate phase RAFSS area visited as a reference site for Santa Ana River woolly-star (*Eriastrum densifolium* ssp. *sanctorum*).

1 **3. Santa Ana River Woolly-Star**

2 The Santa Ana River woolly star (*Eriastrum densifolium* ssp. *sanctorum*) is federally and state
3 listed as endangered and is listed by the California Native Plant Society (CNPS) as rare and
4 endangered in California and elsewhere (List 1B). Santa Ana River woolly star is a perennial
5 herb or subshrub, and may reach a height of three feet. The prickly leaves are gray-green and
6 densely woolly. The flowers are bright blue and bloom from June to September. Santa Ana
7 River woolly star occurs in gravelly riverbeds within chaparral or coastal scrub habitat
8 classified as RAFSS. It has been reported in association with California juniper (*Juniperus*
9 *californica*), mountain mahogany (*Cercocarpus betuloides*) and yerba santa (*Eriodictyon*
10 *trichocalyx*). Occurrences for this species have been recorded within the SAR wash and floodplain. See
11 Figure 3.3-1 of the ADEIR. A large number of subpopulations are recorded from San
12 Bernardino International Airport (former Norton Air Force Base) east to Greenspot Road.
13 Another documented occurrence of this species is 0.6 miles north of the mouth of Morton
14 Canyon, although it is likely that this subpopulation was eliminated during construction of the
15 dam. Threats to this species include urban development, habitat conversion, and flood control
16 along the SAR. Other threats include sand and gravel mining, off-road vehicle activity, and
17 non-native plants.

18 This species occurs only in the floodplain of the SAR where it is most commonly associated
19 with early successional and intermediate phases of RAFSS habitat (Burk et al. 1988). It is found
20 primarily on newer surfaces of coarse, loose sand deposits where perennial and annual plant
21 cover is relatively low. This subshrub is also found in intermediate to mature aged RAFSS
22 habitats, but to a lesser extent. Within the more mature RAFSS community, it is often found
23 where animals have moved fresh sand to the surface or where minor stream channels have
24 deposited sand locally.

25 To protect significant populations of this species, lands within the corridor of the SAR and
26 portions of the alluvial fan terraces were set aside as a conservation area. The Woolly Star
27 Preserve Area (WSPA) is a 764-acre area located west of the Greenspot Road bridge that crosses
28 the SAR. The WSPA includes active channel habitat as well as floodplain areas that support
29 early and intermediate phase RAFSS. The WSPA was established as mitigation in the 1990's by
30 the USACE and the local sponsors to address impacts related to the construction of the SOD.
31 The local sponsors were responsible for developing the mitigation and monitoring plan as well
32 as a long-term management approach for the WSPA.

33 Although intermediate to mature RAFSS and RAFSS disturbed by pipeline installation during
34 the early 1970s are present along the proposed Plunge Pool Pipeline Corridor, it was not
35 observed there during surveys conducted in the area during 2001 and 2003 as described in the
36 ADEIR. Based on these surveys results, it was concluded that the Santa Ana River woolly star
37 was not present along the surveyed corridor during 2003.

38 Known populations of the woolly star and portions of the WSPA are known to be present
39 within the historical overflow area in reach 2, north of the main channel just downstream of its
40 confluence with Mill Creek. It is assumed that these overbank areas area occupied by the
41 species because of the prevalence of records in this area. It is assumed that in the absence of
42 flood-mediated habitat renewal (removing vegetation and leaving a deposit of fresh moist soil)
43 competing vegetation would gradually cause reductions in the woolly star population.

1 **4. San Bernardino Kangaroo Rat**

2 The San Bernardino kangaroo rat (SBKR) is a federally-listed endangered species uniquely
3 adapted to its arid habitat. Soil type and vegetation appear to be the most important factors in
4 determining habitat suitability. This subspecies is found primarily on sandy loam substrates,
5 characteristic of alluvial fans and flood plains, where they are able to dig simple, shallow
6 burrows (McKernan 1997).

7 The preferred vegetation type is also associated with alluvial fans, where the common elements
8 are open habitat characterized by low shrub canopy cover (7 to 22 percent cover) (USACE 2000).
9 Although the SBKR occasionally occupies sage scrub just outside an alluvial fan, alluvial scrub
10 supports the highest population densities (USACE 2000). Additional studies of the SBKR in the
11 study area assessed biological and physical habitat variables to determine their relationship
12 with SBKR abundance. Seven variables were determined to be significantly correlated with
13 higher SBKR abundance including the following: the 1938 and more recent floods, smooth
14 boulders without lichens, pioneer to intermediate Riversidian Alluvial Fan Sage Scrub (RAFSS),
15 greater than 40 percent bare ground, less than 60 percent vegetative cover, low grass cover, and
16 low litter cover (USACE 2000).

17 Abundance appeared to be highest in pioneer and intermediate RAFSS, which generally dates
18 from 1969 to the present. An additional observation was that the abundance of SBKR within a
19 mechanically disturbed (i.e., formerly mined) site was as high, or higher than in naturally
20 disturbed habitats with pioneer to intermediate stage RAFSS. Although abundance was low in
21 more mature habitat, it is important to note that most of this habitat occurs in areas that are
22 higher in elevation, and more distant from the main channel and thus may provide an
23 important refuge for SBKR during flood events (USACE 2000).

24 The historical range of the SBKR extends from the San Bernardino Valley in San Bernardino
25 County to the Menifee Valley in Riverside County (Lidicker 1960, Hall 1981) [Please provide full
26 citation at the end of this document]. Within this range, the SBKR was known from over 25
27 localities (McKernan 1993). From its discovery during the early 1880's to the early 1930's, the
28 SBKR was a common resident of the San Bernardino and San Jacinto valleys of Southern
29 California (Lidicker 1960). Related subspecies of Merriam's kangaroo rat occur in the Mojave
30 and Sonoran deserts.

31 Within the last 70 years, habitat loss and degradation due to increased development and
32 conversion to agricultural uses has significantly reduced the distribution and population sizes
33 of the SBKR. In 1997, the SBKR was known to occupy approximately 3,247 acres of suitable
34 habitat divided unequally among seven locations, which are widely separated from one another
35 (McKernan 1997). Four of these locations, including City Creek (20 acres), Etiwanda (5 acres),
36 Reche Canyon (5 acres), and South Bloomington (2 acres), support only small, remnant
37 populations (McKernan 1997). The remaining three locations, including the SAR (1,725 acres),
38 Lytle and Cajon washes (1,140 acres), and San Jacinto River (350 acres) contain the largest extant
39 concentrations of SBKR and blocks of suitable habitat (McKernan 1997, USFWS unpub. GIS
40 maps 1998).

41 Within the project area, the US Fish and Wildlife Service (USFWS) estimated the current range
42 of the SBKR to include about 6,500 acres on the SAR alluvial fan, the lower fan of Mill Creek,

1 and the lower reach of City Creek (USFWS 1988). The amount of suitable habitat within these
2 areas was estimated by the USFWS at 3,679 acres (USFWS 1988). Lands considered unsuitable
3 include the active channel of the SAR, agricultural and residential land, some of the more
4 mature chamise chaparral, and heavily disturbed areas associated with aggregate mining,
5 groundwater recharge basins, and the borrow pit used during construction of the SOD.
6 Subsequent surveys (1999) conducted by local SBKR experts, indicate that SBKR may occasional
7 utilize all but the most severely disturbed habitats on the alluvial fan (USACE 2000).

8 In summary, the combined studies indicate that SBKR is expected to occur throughout the area
9 between RM 69.7 and RM 61.5, west of Greenspot Road. Although the SBKR occupies younger
10 RAFSS, most of the active channel and some of the immediately adjacent terraces are scoured
11 too frequently to support RAFSS and subsequently are not expected to support the SBKR.
12 Focused surveys conducted within those portions of the SAR alluvial fan associated with
13 project construction activities yielded no observations of this species (SAIC 2003).

- 14 • There are only six populations remaining, three of which are vary small remnant
15 populations. OF the remaining three substantial populations, the Santa Ana River
16 alluvial fan population is the largest, representing as much as 25% of the occupied
17 habitat for the SBKR.
- 18 • Habitat within and adjacent to the PPP footprint is low to moderate quality for the SBKR
19 and is adjacent to disturbed areas such as Greenspot Road, citrus groves, and the SOD
20 borrow pit. Evidence of past disturbance is also present due to foothill pipeline
21 construction, water conservation district canal and basin construction and maintenance,
22 and SOD construction. In addition, there are no records of SBKR within the PPP
23 corridor and recent protocol trapping surveys were negative.
- 24 • The PPP footprint area is near the edge of the SAR alluvial fan, at the edge of potentially
25 suitable habitat, and outside of the edge of the occupied habitat on the fan.
- 26 • Future occupation of the eastern 75% of the Plunge Pool Pipeline corridor area is
27 unlikely due to its near isolation from occupied habitat. The western 25%, conversely, is
28 contiguous with large portions of the fan known to be occupied by SBKR. During
29 extreme population expansions, the SBKR population may expand outward and into
30 less suitable areas such as the western 25% of the Plunge Pool Pipeline alignment.
- 31 • Habitat within the area potentially affected by reduced over-bank flooding is high
32 quality and occupied.

33 5. California gnatcatcher (*Polioptila californica californica*)

34 The coastal California gnatcatcher is found on the coastal slopes of southern California, from
35 southern Ventura southward through Los Angeles, Orange, Riverside, San Bernardino and San
36 Diego counties into Baja California, Mexico (AOU 1957; Atwood 1980, 1990; Jones and Ramirez
37 1995). Gnatcatchers were considered locally common in the mid-1940's but had declined
38 substantially in the United States by the 1960's (Atwood 1980). Although observed declines in
39 numbers and distribution of the gnatcatcher resulted from numerous factors, habitat
40 destruction, fragmentation, and degradation are the principal reasons for the Federal listing of
41 the gnatcatcher as threatened in 1993 (58 FR 16742). The gnatcatcher typically occurs in or near

1 coastal sage scrub (CSS), which is composed of relatively low-growing, dry-season deciduous,
2 and succulent plants. Characteristic plants of this community include California sagebrush
3 (*Artemisia californica*), California buckwheat (*Eriogonum fasciculatum*), laurel sumac (*Malosma*
4 *laurina*), lemonadeberry (*Rhus integrifolia*), bush penstemon (*Keckiella antirrhinoides*), *Salvia* spp.,
5 *Encelia* spp., and *Opuntia* spp. (Atwood 1990, Beyers and Wirtz 1997, Braden et al. 1997a,
6 Weaver 1998). Up to 90 percent of CSS has been lost as a result of development and land
7 conversion (Barbour and Major 1977, Westman 1981a, 1981b), and CSS is considered to be one
8 of the most depleted habitat types in the United States (Kirkpatrick and Hutchinson 1977,
9 Axelrod 1978, Klopatek et al. 1979, Westman 1987, O'Leary 1990). In addition to agricultural use
10 and urbanization, increased fire frequency and the introduction of exotic plants have had an
11 adverse impact on CSS (USFWS 2002).

12 CSS is patchily distributed throughout the range of the gnatcatcher, and gnatcatchers are not
13 uniformly distributed within the structurally and floristically variable CSS. Gnatcatchers occur
14 most frequently within California sagebrush-dominated stands of CSS (Atwood 1990, Atwood
15 et al. 1998a, Atwood et al. 1999, Beyers and Wirtz 1997), and Weaver (1998) found that
16 gnatcatcher densities in northern San Diego County are highest in areas where California
17 buckwheat or California encelia (*Encelia californica*) are co-dominant with sagebrush. Despite
18 these general habitat preferences, all shrub species within CSS are used by gnatcatchers.
19 Gnatcatchers are typically found in stands of CSS that have moderate shrub canopy cover (40-80
20 percent) (Atwood 1980, 1988; Beyers and Wirtz 1997). The relative density of shrub cover
21 influences gnatcatcher territory size, with territory size increasing as shrub cover decreases,
22 probably due to limited resource availability. Gnatcatchers will use sparsely vegetated CSS as
23 long as perennial shrubs are available, although there appears to be a minimum cover threshold
24 below which the habitat becomes unsuitable (Beyers and Wirtz 1997) (USFWS 2002).

25 The occurrence of the California gnatcatcher (CAGN) within the project areas is extremely rare.
26 The USFWS estimates that Ventura and San Bernardino Counties combined may contain only
27 1% of the total species (USFWS 2000). The site is also located at the northeastern extent of the
28 CAGN range. Individual birds have been observed on a few occasions (5 records in the
29 CNDDDB although the USFWS is aware of 27 recent sightings), but the species has only been
30 observed attempting to breed within the vicinity on one occasion and it has never been detected
31 during numerous sets of focused protocol surveys in the area (Burns et al., 1998). Surveys of the
32 project area conducted in 2003 also resulted in no observations of CAGN. In 1996, ten pairs of
33 CAGN were estimated to occur in the region (Burns et al., 1998). Consequently, use of the area
34 is expected only on rare occasions as transients or juveniles disperse from breeding populations
35 in adjacent regions.

36 Although RAFSS is a closely related scrub community, coastal sage scrub and Riversidian sage
37 scrub (RSS - a regional form of CSS prevalent on hillsides in the project region) are much more
38 commonly occupied by CAGN (USFWS, 2000). Other community types are occasionally used
39 where they are adjacent to preferred, occupied habitat or temporarily used when individuals
40 are dispersing from occupied habitat. Based on the lack of observations of CAGN, RAFSS
41 appears to be rarely suitable for CAGN occupation. In addition, most of the RAFSS in the
42 impacts area is adjacent to disturbed areas or otherwise unsuitable habitat.

1 The more preferred non-alluvial habitat, RSS, occurs within the project disturbance area in
2 small patches of moderate to high quality but is unlikely to be occupied based on the negative
3 results of focused surveys and extreme rareness in the region (Burns et al., 1998; USACE 2000).

4 Due to a large increase in number of recent sightings in the region (most unpublished) within
5 RAFSS and RSS, some biologist have theorized that RAFSS may provide important habitat for
6 the recovery of this species in the San Bernardino Valley. They have also suggested that
7 conservation of occupied as well as unoccupied habitat may be required in order to preserve
8 this population at the northeastern periphery of the CAGN's range (Burns et al. 1998).

9 As described under the discussion of RAFSS impacts, successful restoration of this community
10 types is not well documented. Factors such as soil composition and flood-dependent habitat
11 renewal are difficult to restore or replicate and may limit RAFSS restoration potential. As a
12 result, project removal of RAFSS may become a permanent loss of potentially suitable habitat
13 for the CAGN or reduce the suitability permanently.

14 **6. Santa Ana Sucker (*Catostomus santaanae*)**

15 The Santa Ana sucker, a federally-listed threatened species, is a bottom-feeding fish with an
16 average length of approximately 4.5 inches and a maximum length of about eight inches (Moyle
17 1976). They occupy small- to medium-sized permanent streams with depths ranging from a
18 few inches to three feet or more with flows that range from slow to swift. All the streams
19 preferred by this species are subject to periodic severe flooding. Santa Ana suckers appear to be
20 most abundant where the water is cool (less than 72°F) and clear, although they can tolerate and
21 survive in seasonally turbid water (USFWS 2004). This species prefers coarse substrates
22 consisting of gravel, rubble, and boulders (USFWS 2004). Although the sucker has been
23 reported to be highly susceptible to polluted water, a recent study conducted by the OCWD
24 indicates that the quality of the water is not a factor in the sucker's decline (OCWD 2001,
25 Tennant 2002 pers. comm.). Larvae and young may be found in a greater variety of substrates
26 where the margins of the streams gradually grade to exposed banks, about six inches deep and
27 shallower. They are much less common where the water is deep up to the shoreline. As fish
28 mature, they move into deeper water. Adults are restricted to holes or pools that are usually 18
29 to 50 inches deep and usually associated with bridge abutments, large clumps of giant reed, the
30 end of gabions, or other obstacles that lead to pool development (MEC and Aspen
31 Environmental Group 2000).

32 Santa Ana suckers typically reach sexual maturity in just over one year and typically live less
33 than three years. Spawning occurs from March to early July, with a peak in spawning activity
34 occurring in late May and June (Moyle 1976). However, surveys within the San Gabriel River
35 have found small juveniles in December indicating that spawning may begin as early as
36 November under some conditions. The fecundity of the Santa Ana sucker is also very high and
37 may be an important characteristic that aids in its recolonization of streams after a severe flood
38 event. This species feeds primarily on detritus, algae, and diatoms (MEC and Aspen
39 Environmental Group 2000).

40 The distribution of the Santa Ana sucker within the SAR corridor extends from just upstream of
41 the Riverside Avenue bridge in Riverside, downstream to a few miles below Imperial Highway
42 in Orange County (below Prado Dam). Surveys of this stretch of the River have yielded suckers

1 throughout. The reliability of daily flows within this portion of the river is largely the result of
2 steady effluent releases from several water treatment plants along the river.

3 The decline of the sucker is attributed to urbanization, water diversions, dams, introduced
4 competitors and/or predators (i.e., brown trout), and other human caused disturbances. High
5 flows within the basin between 1991 and 1996 have also been implicated for significant
6 decreases in the Santa Ana sucker populations as evidenced by the low yields of 1996 surveys
7 (USFWS 2004). The USFWS has also stated that random events such as floods may lead to the
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E5: TABULATIONS OF SENSITIVE SPECIES

Following are five tabulations of sensitive species:

1. Table E5-1: State and Federally Listed Threatened and Endangered Species Potentially Occurring in the Project Region
2. Table E5-2: Other Sensitive Species Potentially Occurring in the Project Region

Table E5-1. State and Federally-Listed Threatened or Endangered Species Potentially Occurring in the Project Region

Scientific Name/ Common Name	Status (Fed/State/other)	Habit/Preferred Habitat	Distribution and Occurrence in the Project Area
PLANTS			
<i>Arenaria paludicola</i> Marsh sandwort	FE/SE/1B	Perennial herb, blooms from May to August; found in bogs, freshwater marshes and swamps.	This species is not likely to occur in the project area, nor is suitable habitat present within project area. Formerly known from widely scattered locations, it is currently known only from two locations, one in Mendocino County and one in San Luis Obispo County. Historically, this species was reported from the SAR at 1000' elevation, though the exact location is not known.
<i>Astragalus brauntonii</i> Braunton's milk-vetch	FE/-/1B	Perennial herb, blooms from March to July; found in closed-cone coniferous forest, chaparral, coastal scrub, valley and foothill grassland communities often in areas of recent burns or disturbed areas.	There are no known records or occurrences of this species in the San Bernardino Mountains, and it was not observed during a reconnaissance survey for the Seven Oaks Dam reservoir/inundation area that occurred in the spring of 1999 (MEC and Aspen, 2000).
<i>Berberis nevinii</i> Nevin's barberry	FE/SE/1B	Evergreen shrub, blooms from March to April; found with sandy or gravelly soils in chaparral, cismontane woodland, coastal scrub, and riparian scrub communities.	This species is known from Scott's Canyon and San Timoteo Canyon, in San Bernardino and Riverside counties respectively, but is unknown in the San Bernardino Mountains or along the SAR below Seven Oaks Dam. This species was not observed during a reconnaissance survey for the Seven Oaks Dam reservoir/inundation area, which occurred in the spring of 1999 (MEC and Aspen, 2000). Suitable habitat occurs within the project area, although the species is not known from the area.
<i>Brodiaea filifolia</i> Thread-leaved brodiaea	FE/ST/1B	Perennial herb, blooms from March to June; found in chaparral openings, cismontane woodland, coastal scrub, playas, valley and foothill grasslands, and vernal pool habitat, often with clay soils.	This species has been recorded for Arrowhead Hot Springs in Waterman Canyon upstream from the project area, but was not observed during a reconnaissance survey for the Seven Oaks Dam reservoir/inundation area, which occurred in the spring of 1999 (MEC and Aspen, 2000).
<i>Cordylanthus maritimus ssp. maritimus</i> Salt marsh bird's beak	FE/SE/1B	Annual herb, hemi parasitic, blooms from May to October; found in coastal dunes, and coastal salt marshes and swamps.	This species is not likely to occur in the proposed Lytle Creek project area or the Devil Canyon project area. This species was last seen in the San Bernardino Valley in 1889 and is possibly extirpated. The exact location of the reported occurrence is unknown.

Table E5-1. State and Federally-Listed Threatened or Endangered Species Potentially Occurring in the Project Region

Scientific Name/ Common Name	Status (Fed/State/other)	Habit/Preferred Habitat	Distribution and Occurrence in the Project Area
PLANTS (CONTINUED)			
<i>Dodecahema leptoceras</i> Slender-horned spineflower	FE/SE/1B	Annual herb, blooms from April to June; found on sandy soils in chaparral, cismontane woodland, and alluvial fan with coastal scrub habitat.	This species was not found in areas that would be affected by proposed project construction activities during reconnaissance surveys during June, 2001 and focused surveys conducted during April, May, and June, 2003. However, it is known to occur near the project area within the Riversidian alluvial fan sage scrub. One occurrence was recorded within the Santa Ana wash one mile south of Greenspot Road and 0.5 miles east of an old railroad grade. Further notes from occurrences of Parry's spineflower indicate slender-horned spineflower was growing nearby, south of Greenspot Road and east of Orange Street.
<i>Eriastrum densifolium ssp. sanctorum</i> SAR woolly star	FE/SE/1B	Perennial herb, blooms from June to September; found in chaparral, alluvial fan with coastal scrub, on sandy or gravelly soils.	This species was not found in areas that would be affected by proposed project construction activities during reconnaissance surveys during June, 2001 and focused surveys conducted during April, May, and June, 2003. However, this species is known to be present within the general project area within the Riversidian alluvial fan sage scrub. Populations of this species have been observed within the SAR wash and floodplain. A large number of subpopulations are recorded from Norton Air Force Base east to Greenspot Road. Another documented occurrence of this species is 0.6 miles north of the mouth of Morton Canyon between the stream gage station and the SCE powerhouse; that this population was most likely eliminated by construction of the dam. In response to the construction of the dam, the USACE was required to establish the Woolly Star Preserve Area (WSPA). This area begins downstream from the Greenspot Road bridge crossing of the SAR and encompasses a total of 764 acres of contiguous and non-contiguous blocks of land that support Riversidian alluvial fan sage scrub habitat within and adjacent to the active channel.
<i>Rorippa gambelii</i> Gambel's water cress	FT/SE/1B	Perennial herb, blooms from April to September; found in freshwater or brackish marshes and swamps.	This species is not likely to occur in the project area, nor is suitable habitat present within project area (MEC and Aspen, 2000). Formerly more wide-spread it is only known in California from four locations within Santa Barbara and San Luis Obispo counties. Historically this species was reported in San Bernardino County, but it is believed to be extirpated.
WILDLIFE			
FISH			
<i>Catostomus santaanae</i> Santa Ana sucker	FT/CSC	Sand, rubble, boulder bottoms; cool, clear water; feed on algae.	Known to occur at several locations in SAR between Riverside Avenue Bridge and a point a few miles below Imperial Highway. Critical Habitat has been designated in the project area..

Table E5-1. State and Federally-Listed Threatened or Endangered Species Potentially Occurring in the Project Region

Scientific Name/ Common Name	Status (Fed/State/other)	Habit/Preferred Habitat	Distribution and Occurrence in the Project Area
AMPHIBIANS AND REPTILES			
<i>Bufo californicus</i> Arroyo toad	FE/CSC	Sandy stream terraces with closed canopies and grassy groundcover next to permanent stream.	This species is rare in the region and no observations have been documented from within the project area. Although marginally suitable habitat exists in a few areas of the SAR wash, all documented surveys have been negative. This species is not expected to occur within the project area.
<i>Rana aurora draytonii</i> California red-legged frog	FT/CSC	Humid forests, woodlands, grasslands and streamsides, especially where cattails and other plants provide good cover.	The historical distribution of this species included the SAR (Jennings and Hayes 1994). Currently however, this species is extremely rare in the region and no observations have been documented from within the project area. Although marginally suitable habitat occurs within several areas of the SAR between Prado Basin and RM 29.5, this species is not expected due to its extreme rarity in Southern California and lack of documented occurrence in the area.
<i>Rana muscosa</i> Mountain yellow-legged frog	FE/CSC	Sunny riverbanks, meadows, streams, isolated pools, lake borders.	This species is rare in the region and no observations have been documented from within the project area. Although marginally suitable habitat exists in a few areas of the SAR wash, all documented surveys have been negative for the occurrence of this species (MEC and Aspen, 2000). This species is not expected to occur within the project area.
BIRDS			
<i>Buteo swainsoni</i> (nesting) Swainson's hawk	FSC/ST	Forages over grasslands, savannas, and open areas. Nests in scattered trees near open areas. Nesting is rare in southern California.	No observations of this species within the project area have been documented. Individuals of this species may occasionally migrate through the region but nesting within the project area is not expected.
<i>Haliaeetus leucocephalus</i> (nesting & wintering) Bald eagle	FT (FPD)/SE	Lakes, reservoirs, rivers, offshore islands, and some rangelands and coastal wetlands in southern California. Nests in large snags and old-growth trees near large water bodies.	This species is rare in the region and occurs only at a few isolated locations, such as Big Bear Lake. No observations of this species within the project area have been documented, nor is it expected to occur in the project area.
<i>Falcon peregrinus anatum</i> (nesting) American peregrine falcon	FSC (delisted)/SE (FP)	Forages over open areas, especially over water. Nests on cliffs with small caves; sometimes in cities.	No observations of this species within the project area have been documented. Individuals of this species may occasionally migrate through the region but nesting within the project area is not expected.
<i>Coccyzus americanus occidentalis</i> (nesting) Western yellow-billed cuckoo	FC/SE	Dense, wide, deciduous riparian woodlands with well-developed understories; almost exclusively dominated by willow species.	This species is rare in the region and few observations have been documented. One historical record indicates the presence of this species within the Prado Basin. Suitable habitat occurs in several reaches of the SAR below RM (mile #24) and within Prado Basin. This species is not expected to occur within the project area due to its extreme rarity in the region.

Table E5-1. State and Federally-Listed Threatened or Endangered Species Potentially Occurring in the Project Region

Scientific Name/ Common Name	Status (Fed/State/other)	Habit/Preferred Habitat	Distribution and Occurrence in the Project Area
BIRDS (CONTINUED)			
<i>Empidonax trailii extimus</i> (nesting) Southwestern willow flycatcher	FE/-	Low elevational sites; riparian woodlands that contain water and low growing willow thickets. High elevational sites; large, flat, wet meadows that contain patches of willow trees.	This species has been documented at several locations along the SAR from the confluence of San Timoteo Creek downstream to, and including, Prado Basin (MEC and Aspen, 2000). In addition, a breeding pair was observed near the confluence of Mill Creek and occupied habitat was detected approximately one mile upstream within Mill Creek (McKernan 2000). This species is expected to occur within the SAR, below the confluence of San Timoteo Creek and may potentially occur adjacent to the proposed Morton Canyon Connector pipeline alignment. It is not expected to occur at other project locations due to lack of suitable habitat and negative results of focused surveys.
<i>Empidonax trailii</i> (nesting) Willow flycatcher	-/SE	Wet meadow and montane riparian habitats, river valleys, and large mountain meadows	Several subspecies migrate through the project area and have occasionally been observed (McKernan 2000). However, only the subspecies " <i>extimus</i> " has potential to breed in the region. This subspecies is discussed above.
<i>Polioptila californica</i> Coastal California gnatcatcher	FT/CSC	Coastal sage scrub vegetation below 2,500 feet elevation in Riverside County and generally below 1,000 feet elevation along the coastal slope; generally avoids steep slopes and dense vegetation for nesting.	This species is rare in the region and few sightings have been documented. One record indicates an observation of this species near the center of the SAR alluvial fan. Another sighting in 1998 documented gnatcatchers east of Opal Avenue and just south of the SAR wash as well as at the confluence the SAR and Mill Creek (McKernan 2000). Although potentially suitable habitat is present, this species is unlikely to occur within the San Bernardino County project areas other than as a transient due to its rarity, the lack of breeding records in the region, and negative results of focused surveys. Within the vicinity of Prado Basin and just up-stream, this species is more common and is occasionally observed. However, the project areas that occur here, the SAR corridor and Prado Basin, are unlikely to support this species due to the lack of suitable habitat.
<i>Vireo bellii pusillus</i> (nesting) Least Bell's vireo	FE/SE	Perennial and intermittent streams with low, dense riparian scrub and riparian woodland habitats below 2,000 feet elevation; nests primarily in willows and forages in the riparian and occasionally in adjoining upland habitats. Associated with stands of willow, cottonwood, and mulefat.	The CNDDDB indicate, the presence of this species at several locations within the SAR from Prado Basin upstream to RM 17. In recent years, several hundred territories have been detected within Prado Basin (Tennant 2002, pers. comm.). This species has also been detected at the confluence of the SAR and Mill Creek (McKernan 2000). The least Bell's vireo is expected to occur within the SAR below RM 17 and may potentially occur adjacent to the proposed Morton Canyon Connector pipeline alignment. In addition, one individual vireo was observed within the Lower Lytle Creek basins conveyance channel. It is not expected to occur at other project locations due to lack of suitable habitat and negative results of focused surveys.

Table E5-1. State and Federally-Listed Threatened or Endangered Species Potentially Occurring in the Project Region

Scientific Name/ Common Name	Status (Fed/State/other)	Habit/Preferred Habitat	Distribution and Occurrence in the Project Area
MAMMALS			
<i>Dipodomys merriami parvus</i> San Bernardino Merriam's kangaroo rat	FE/CSC	Alluvial fan sage scrub.	This subspecies is known to occur throughout most of the SAR alluvial fan where suitable RAFSS is present (MEC and Aspen, 2000). Portions of Lytle Creek upstream from the proposed project are also known to support this sub-species. The remaining project areas, within SAR Canyon and at Devils Canyon are not expected to support this sub-species due to the limited amount of habitat and negative results of focused surveys (MEC and Aspen, 2000; SAIC 2003).
<i>Dipodomys stephensi</i> Stephens' kangaroo rat	FE/ST	Annual and perennial grasslands and coastal sage scrub with sparse canopy cover.	The San Bernardino County project areas are outside of the known range of this species and the project areas in Riverside County are unlikely to contain suitable habitat due to their riparian nature. This species is not expected to occur within the project areas.
<p><i>Sources:</i> CNDDDB, 2002; CNPS, 2001; MEC and Aspen, 2000; Hickman, 1993; USACE 2000</p> <p><i>Status:</i></p> <p>Federal (U.S. Fish and Wildlife Service or National Marine Fisheries Service) E = Endangered (In danger of extinction throughout all or a significant portion of its range.) T = Threatened</p> <p>State (California Department of Fish and Game) E = Endangered T = Threatened R = Rare</p> <p>California Native Plant Society (CNPS) 1A = List 1A (Plants presumed Extinct in California) 1B = List 1B (Plants rare and endangered in California and elsewhere.) 3 = List 1B (Need More Information on the species) 4 = List 4 (Plants of limited distribution-A watch list)</p> <p>FE: Federally-listed endangered FT: Federally-listed threatened FC: Federal candidate species (former Category 1 candidates) FSC: Federal Species of Concern SE: State-listed endangered ST: State-listed threatened CSC: California Species of Special Concern FP: California Fully Protected Species FPD: (see bald eagle)</p>			

Table E5-2. Other Sensitive Species Potentially Occurring in the Project Region

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Scientific Name/ Common Name	Status (Fed/State/other)	Habit/Preferred Habitat	Distribution and Occurrence in the Project Area
PLANTS			
<i>Calochortus plummerae</i> Plummer's mariposa lily	-/-/1B	Perennial herb, blooms from May to July. Found in communities with granitic or rocky soils in association with chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest, valley and foothill grasslands.	This species has been located by the EIR preparers in several small colonies along the Plunge Pool Pipeline Corridor and in the vicinity of the existing spreading basins at Lytle Creek. One previously documented occurrence was recorded in the SAR wash between San Bernardino International Airport and Greenspot Road within Riversidian alluvial fan sage scrub. Additional previously documented occurrences are located within the proposed Devil Canyon project area approximately one mile east of the project site.
<i>Chorizanthe parryi</i> var. <i>parryi</i> Parry's spineflower	-/-/3	Annual herb, blooms from April to June. Found in sandy or rocky openings within chaparral and coastal scrub communities.	This species is present in numerous localized colonies along the western portion of the Plunge Pool Pipeline corridor and in the vicinity of the existing drainage channel and spreading basins in Lytle Creek. Several previously documented occurrences were recorded within the SAR wash, south of Greenspot Road and east of Orange Street. Additional previously documented occurrences were located within the proposed Lytle Creek and Devil Canyon project areas. Within the Lytle Creek area, one previously documented occurrence was recorded in the Cajon Wash near the confluence with Lytle Creek. An additional previously documented occurrence was located approximately half a mile south of the proposed Devil Canyon project area at the mouth of Devil Canyon.
<i>Juglans californica</i> Southern California black walnut	-/-/4	Deciduous tree blooms from March to May; found in chaparral, cismontane woodland, and coastal scrub habitats associated with alluvial soils.	This species is part of a fragmented, declining natural community that is rare in Orange, Riverside, San Bernardino and San Diego counties. Potential habitat may be present downstream of the Seven Oaks Dam. It is not known from the project area, nor is it expected to occur in the project area.
<i>Lepidium virginicum</i> var. <i>robinsonii</i> Robinson's pepper- grass	-/-/1B	Annual herb, blooms from January to July. Found in chaparral and coastal scrub communities.	This species is presumed to occur within the project area. One occurrence was recorded 2.8 miles north/northeast of Mentone, north of the SAR wash, and south of Greenspot Road, in coarse, sandy soil within sage scrub habitat.
<i>Lilium humboldtii</i> ssp. <i>ocellatum</i> Ocellated Humboldt lily	-/-/4	Perennial herb, blooms from March to July; found in chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest and riparian woodland habitats.	This species occurs in many counties, including Riverside and San Bernardino counties. It is not expected to occur below the Seven Oaks Dam, but may occur upstream from the dam.

Table E5-2. Other Sensitive Species Potentially Occurring in the Project Region

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Scientific Name/ Common Name	Status (Fed/State/other)	Habit/Preferred Habitat	Distribution and Occurrence in the Project Area
PLANTS (CONTINUED)			
<i>Lycium parishii</i> Parish's desert-thorn	-/-/2	Shrub, blooms from March to April; found in coastal scrub and Sonoran desert scrub	This species is not likely to occur in the proposed Lytle Creek project area or the Devil Canyon project area. This species was last seen in the vicinity of the benches and foothills of San Bernardino in 1885 and is presumed extirpated. The exact location of the recorded occurrence is unknown, noted as being located in the mesas North of San Bernardino.
<i>Malacothamnus parishii</i> Parish's bush mallow	-/-/1A	Deciduous shrub, blooms from June to July in chaparral or coastal scrub habitat.	This species is not likely to occur in the project area because the only recorded occurrence of this species in the project vicinity was from the SAR wash in 1895; attempts to relocate it have been unsuccessful and the species is presumed extinct.
WILDLIFE			
FISH			
<i>Gilia orcutti</i> Arroyo Chub	-/CSC	Slow water sections of streams with mud or sand substrates.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Rhinichthys osculus</i> ssp. 3 Santa Ana speckled dace	-/CSC	Requires permanent flowing streams with summer water temperatures of 17 to 20°C, shallow cobble and gravel.	Several records indicate the presence of this species within the SAR. May potentially occur in areas of suitable habitat within the SAR.
AMPHIBIANS AND REPTILES			
<i>Scaphiopus hammondii</i> Western spadefoot toad	FSC/CSC	Prefers burrows within relatively open areas in lowland grasslands, chaparral, and pine-oak woodlands, and areas of sandy or gravelly soil in alluvial fans, washes, and floodplains. Requires temporary pools for reproduction.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Rana boylei</i> Foothill yellow-legged frog	FSC/CSC	Stream, riverine woodland, chaparral and forest habitats.	No records within the region; not expected to occur due to its rarity in the region.
<i>Clemmys marmorata pallida</i> Southwestern pond turtle	FSC/CSC	Ponds, marshes, rivers, streams, irrigation ditches.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Phrynosoma coronatum blainvillei</i> San Diego horned lizard	-/CSC	Valley-foothill hardwood, conifer, and riparian habitats, pine-cypress, juniper and annual grassland habitats below 6,000 feet, open country, especially sandy areas, washes, flood plains, and windblown deposits.	Known to occur in the region. Expected to occur in areas of suitable habitat within the project areas. Observed adjacent to the Lower Lytle Creek basins project area.

Table E5-2. Other Sensitive Species Potentially Occurring in the Project Region

Scientific Name/ Common Name	Status (Fed/State/other)	Habit/Preferred Habitat	Distribution and Occurrence in the Project Area
AMPHIBIANS AND REPTILES (CONTINUED)			
<i>Eumeces skiltonianus interparietalis</i> Coronado skink	-/CSC	Scrub, chaparral, and grassland communities; arid conditions.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Cnemidophorus hyperythrus beldingi</i> Beldings' orange-throated whiptail	-/CSC	Valley-foothill hardwood forests, valley-foothill hardwood conifer, mixed conifer, and desert scrub habitats.	Known to occur in the region. Expected to occur in areas of suitable habitat within the project areas.
<i>Anniella pulchra pulchra</i> Silvery legless lizard	FSC/CSC	Occurs in several habitats but especially in coastal dune, valley-foothill, chaparral, and coastal scrub habitats.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Charina trivirgata</i> Rosy boa	FSC/-	Desert and rocky areas in chaparral covered hillsides and canyons.	Known to occur in the region. Expected to occur in areas of suitable habitat within the project areas.
<i>Lampropeltis zonata parvirubra</i> San Bernardino mountain kingsnake	-/CSC	Moist woods, coniferous forests, woodland and chaparral.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Thamnophis hammondi</i> Two-striped garter snake	-/CSC	Riparian and freshwater marshes with perennial water.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Crotalus exsul</i> Northern red-diamond rattlesnake	-/CSC	Chaparral, woodland, and arid desert habitats in rocky areas with dense vegetation.	Known to occur in the region. Expected to occur in areas of suitable habitat within the project areas.
Birds			
<i>Phalacrocorax auritus</i> (rookery site) Double-crested cormorant	-/CSC	Coastal, bays, lakes, and rivers.	Known to occur in Prado Basin. Not expected to occur in other project areas due to lack of suitable habitat.
<i>Egretta thula</i> (rookery) Snowy egret	FSC/-	Marshes, ponds, swamps, shores, tidal flats	Known to occur in the region. Expected to occur in areas of suitable habitat within the project areas.
<i>Plegadis chihi</i> (rookery site) White-faced ibis	FSC/CSC	Fresh water marshes; irrigated lands, tules.	Frequently observed within Prado Basin wetlands. Not expected to occur in other project areas due to lack of suitable habitat.
<i>Accipiter cooperi</i> (nesting) Cooper's hawk	-/CSC	Heavily wooded, semi-open areas, breeds in riparian and oak woodland.	Known to occur in the region. Expected to occur in areas of suitable habitat within the project areas.
<i>Accipiter gentilis</i> (nesting) Northern goshawk	FSC/CSC	Coniferous and deciduous forests; forest edges; winters in low lands.	No observations of this species within the project areas have been documented. Individuals of this species may infrequently migrate through the region but nesting within the project area is not expected.

Table E5-2. Other Sensitive Species Potentially Occurring in the Project Region

Scientific Name/ Common Name	Status (Fed/State/other)	Habit/Preferred Habitat	Distribution and Occurrence in the Project Area
BIRDS (CONTINUED)			
<i>Accipiter striatus</i> (nesting) Sharp-shinned hawk	-/CSC	Forages over chaparral and other scrublands; prefers riparian habitats and north-facing slopes, with plucking perch sites, nests in woodlands.	Known to occur in the region. Observed along the proposed Plunge Pool Pipeline alignment. Expected to occur in areas of suitable habitat within the project areas.
<i>Aquila chrysaetos</i> (nesting and wintering) Golden eagle	-/CSC (FP)	Forages over variety of open habitat. Nests in rugged mountain areas.	Known to occur in the region. Expected to occur in areas of suitable habitat within the project areas.
<i>Buteo regalis</i> (wintering) Ferruginous hawk	FSC/CSC	Rivers, lakes, and coastal areas; grasslands and agricultural areas in winter. Does not nest in southern California; however, a fairly common winter visitor.	No observations of this species within the project areas have been documented. Individuals of this species may occasionally migrate through the region but nesting within the project area is not expected.
<i>Circus cyaneus</i> (nesting) Northern harrier	-/CSC	Nests in coastal salt marshes, freshwater marshes, grasslands, and agricultural fields; occasionally forages over open desert and brushlands.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Elanus leucurus</i> (nesting) White-tailed kite	FSC/FP	Forages in meadows and open areas. Nests in riparian.	Frequently observed in the region. Expected to occur within the lower SAR and Prado Basin and potentially in upstream wash areas.
<i>Pandion haliaetus</i> (nesting) Osprey	-/CSC	Requires large, fish-bearing waters for foraging. Nests at the top of large snags, dead-topped trees, cliffs, or human-made structures.	Known to occur in Prado Basin. Not expected to occur in other project areas due to lack of suitable habitat.
<i>Falco columbarius</i> (wintering) Merlin	-/CSC	Coastlines, wetlands, woodlands, agricultural fields, and grasslands.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Falco mexicanus</i> (nesting) Prairie falcon	-/CSC	Forages in dry open habitat. Nests on cliffs with potholes.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Asio flammeus</i> (nesting) Short-eared owl	-/CSC	Prairies, marshes, dunes, tundra.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.

Table E5-2. Other Sensitive Species Potentially Occurring in the Project Region

Scientific Name/ Common Name	Status (Fed/State/other)	Habit/Preferred Habitat	Distribution and Occurrence in the Project Area
BIRDS (CONTINUED)			
<i>Athene cunicularia</i> (burrow sites) Burrowing owl	FSC/CSC	Dry grasslands, desert habitats, open pinyon-juniper and ponderosa pine woodlands below 5,300 feet elevation. Prefers berms, ditches, and grasslands adjacent to rivers, agricultural, and scrub areas.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas. However, focused surveys conducted in 2003 did not detect this species within any of the proposed pipeline corridors.
<i>Strix occidentalis occidentalis</i> California spotted owl	FSC/CSC	Oak and oak-conifer habitats.	Not expected to occur within project areas due to lack of suitable habitat.
<i>Chaetura vauxi</i> (nesting) Vaux's swift	FSC/CSC	Redwood and Douglas fir habitats. During migration will forage over most terrains and habitats.	No observations of this species within the project areas have been documented. Individuals of this species may occasionally migrate through the region but nesting within the project area is not expected.
<i>Calypte costae</i> (nesting) Costa's hummingbird	FSC/-	Deserts, washes, mesas, sage scrub, arid hillsides.	Common in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Contopus cooperi</i> (nesting) Olive-sided flycatcher	FSC/-	Conifer forests and occasionally Eucalyptus groves.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Empidonax difficilis</i> (nesting) Pacific slope flycatcher	FSC/-	Moist woods, mixed conifer forests, shady canyons, groves.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Lanius ludovicianus</i> (nesting) Loggerhead shrike	FSC/CSC	Open grassland, savannas, and chaparral.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Eremophila alpestris actia</i> California horned lark	-/CSC	Open grasslands, fields, and agricultural areas.	Known to occur in the region. Expected to occur in areas of suitable habitat within the project areas.
<i>Progne subis</i> (nesting) Purple martin	-/CSC	Nests in woodland areas, and semi-open country near water.	No observations within the project area have been documented. Individuals may occasionally migrate through the region but nesting within the project area is not expected.
<i>Campylorhynchus brunneicapillus couesi</i> Coastal cactus wren	-/CSC	Coastal sage scrub, vegetation with thickets of prickly pear or cholla cactus.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas. Observed adjacent to the Lower Lytle Creek basins project area.
<i>Toxostoma lecontei</i> Le Conte's thrasher	FSC/CSC	Desert flats with sparse shrubs.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Toxostoma redivivum</i> California thrasher	FSC/-	Chaparral, foothills, valley thickets, parks, gardens.	Known to occur in the region. Observed along the proposed plunge pool pipeline alignment. Expected to occur in areas of suitable habitat within the project areas.
<i>Dendroica occidentalis</i> (nesting) Hermit warbler	FSC/-	Coniferous forests.	Not expected to occur within project areas due to lack of suitable habitat.

Table E5-2. Other Sensitive Species Potentially Occurring in the Project Region

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Scientific Name/ Common Name	Status (Fed/State/other)	Habit/Preferred Habitat	Distribution and Occurrence in the Project Area
BIRDS (CONTINUED)			
<i>Dendroica petechia brewsteri</i> (nesting) Yellow warbler	-/CSC	Riparian woodlands, montane chaparral, and mixed conifer habitats.	Known to occur in the region. Expected to occur in areas of suitable habitat within the project areas.
<i>Icteria virens</i> (nesting) Yellow-breasted chat	-/CSC	Riparian woodlands with a thick understory.	Known to occur in the region. Expected to occur in areas of suitable habitat within the project areas.
<i>Aimophila ruficeps canescens</i> Southern California rufous-crowned sparrow	-/CSC	Rare residents on chaparral-covered slopes.	Common in the region. Expected to occur in areas of suitable habitat within the project areas.
<i>Amphispiza belli belli</i> (nesting) Bell's sage sparrow	FSC/CSC	Dense, dry chamise chaparral and coastal slopes of coastal sage scrub.	Common in the region. Expected to occur where suitable habitat occurs within the project areas.
<i>Chondestes grammacus</i> (nesting) Lark sparrow	FSC/-	Open country with bushes, trees; pastures, farms, and roadsides.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Spizella atrogularis</i> (nesting) Black-chinned sparrow	FSC/-	Brushy mountain slopes, open chaparral, sagebrush.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
MAMMALS			
<i>Antrozous pallidus</i> Pallid bat	-/CSC	Forages in open areas; roosts in rock crevices and caves.	Known to occur in the region. Expected to occur in areas of suitable habitat within the project areas.
<i>Corynorhinus townsendii pallescens</i> Pale big-eared bat	FSC/CSC	Caves, tunnels, or other structures for roosting, vegetation and mesic edges for feeding, extremely sensitive to roosting site disturbance, maternity roosts are in warm places.	Known to occur in the region. Expected to occur in areas of suitable habitat within the project areas.
<i>Corynorhinus townsendii townsendii</i> Townsend's western big-eared bat	FSC/CSC	Caves, mine tunnels, and buildings.	Known to occur in the region. Expected to occur in areas of suitable habitat within the project areas.
<i>Myotis ciliolabrum</i> Small-footed myotis	FSC/-	Most common in arid wooded and brushy uplands near water from sea level to 8,900 feet.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Myotis yumanensis</i> Yuma myotis	FSC/-	Open forests and woodlands with water sources for foraging.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.

Table E5-2. Other Sensitive Species Potentially Occurring in the Project Region

Scientific Name/ Common Name	Status (Fed/State/other)	Habit/Preferred Habitat	Distribution and Occurrence in the Project Area
MAMMALS (CONTINUED)			
<i>Eumops perotis</i> Western mastiff bat	FSC/CSC	Primarily arid lowlands, especially deserts. Open, semiarid to arid habitats including conifer and deciduous woodlands, coastal scrub, annual and perennial grasslands, palm oases, chaparral, desert scrub, and urban.	Known to occur in the region. Expected to occur in areas of suitable habitat within the project areas.
<i>Nyctinomops macrotis</i> Big free-tailed bat	-/CSC	Rocky cliffs in rugged terrain; ponderosa pines, Douglas fir, and desert shrubs to 1,800 meters msl.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<i>Neotoma lepida intermedia</i> San Diego desert woodrat	-/CSC	Chaparral, coastal sage scrub, and pinyon-juniper woodland.	Known to occur in the region. Expected to occur in areas of suitable habitat within the project areas.
<i>Onychomys torridus ramona</i> Southern grasshopper mouse	FSC/CSC	Low arid scrub and semi-scrub vegetation.	Known to occur in the region. May potentially occur in areas of suitable habitat within the project areas.
<p><i>Sources:</i> CNDDB, 2002; CNPS, 2001; MEC and Aspen, 2000; Hickman, 1993; USACE 2000</p> <p>California Native Plant Society (CNPS) 1A = List 1A (Plants presumed Extinct in California) 1B = List 1B (Plants rare and endangered in California and elsewhere.) 3 = List 1B (Need More Information on the species) 4 = List 4 (Plants of limited distribution-A watch list)</p> <p>FC: Federal candidate species (former Category 1 candidates) FSC: Federal Species of Concern SE: State-listed endangered ST: State-listed threatened CSC: California Species of Special Concern FP: California Fully Protected Species</p>			

E6: TABULATION OF HABITAT ACREAGE IMPACTED BY CONSTRUCTION ACTIVITIES

Following is a tabulation of the disturbed area for a number of community types associated with specific project components.

Table E6-1. Disturbance to Plant Communities by Project Component

Community Type	Low Flow Connector	Plunge Pool Pipeline Phase I	Plunge Pool Pipeline Phase II	Plunge Pool Pipeline Phase III	Morton Canyon Connector	Devil Canyon Bypass Option 1	Devil Canyon Bypass Option 2	Lower Lytle Creek Pipeline	Cactus Basins Pipeline	Total (acres)
Disturbance Corridor (feet)	100	300	300	300	100	150	150	60-100	60	
Disturbed/ Developed (acres)	3.9	10.4	11.9	11.5	2.2	-	-	2.3	15.7	57.9
Mixed Chaparral (acres)	0.2	-	-	0.9	0.9	-	-	-	-	2
Mulefat Scrub (acres)	0.4	-	-	0.8	-	-	-	-	-	1.2
Oak Woodland (acres)	0.8	-	-	1.9	-	-	-	-	-	2.7
Revegetated Area (acres)	2.1	0.7	-	4.9	-	1.5	3.1	-	-	12.3
RAFSS-Intermediate* (acres)	0.1	7.7	35.0	2.0	0.2	-	-	1.7	-	46.2
RAFSS-Degraded* (acres)	-	3.2	8.5	0.6	0.3	-	-	-	-	12.6
RAFSS-p* (acres)	-	-	5.2	-	-	-	-	-	-	5.2
RSS* (acres)	0.3	2.8	-	1.1	0.1	0.2	-	-	-	4.5
SCWRW* (acres)	0.1	-	-	0.3		0.2	0.1	-	-	0.7
Agriculture/ Non-Native Grasses (acres)	-	5.4	2.5	-	-	-	-	-	-	7.9
Total (acres)	7.9	30.2	63.1	24	3.7	1.9	3.2	4.0	15.7	
<p>* RAFSS- Riverside Alluvial Fan Sage Scrub; RAFSS-p- Riverside Alluvial Fan Sage Scrub, with 30 year-old pipeline disturbance in proposed route along Greenspot Road; SCWRW- Southern cottonwood-willow riparian woodland.</p>										

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1 **E7: ALTERNATIVE APPROACHES TO HABITAT RENEWAL**

2 The section describes two alternatives to mitigate for loss of RAFSS habitat as a result of
3 decreased overbank flooding on the alluvial terraces of the Santa Ana River.

4 The first method involves the use of diversion dikes and re-operation of Seven Oaks Dam. The
5 description herein is derived, almost in its entirety, from Option 1 as described in the Seven
6 Oaks Dam Biological Assessment (BA) (USACE 2000). Although there are a variety of methods
7 described in the BA, this method is the most likely to be used by the USACE to mitigate for
8 decreased overbank flooding caused by operation of Seven Oaks Dam. This particular method
9 is described in detail in Section 1.0. Impacts of the Muni/Western Project are similar in nature
10 but at a much smaller scale.

11 An alternative method is proposed to mitigate for decreased overbank flooding resulting from
12 operations of the Project. This method, described below in Section 2.0, involves the use of a
13 large flexible hose, such as a fire hose, to replicate flood scouring.

14 While the goal of both methods is essentially the same, the fire hose method is more feasible for
15 a variety of reasons:

- 16 1. adverse impacts to habitat are substantially less from the fire hose method (i.e., the first
17 method requires construction of large sand dikes in the river and around the sites to be
18 treated and heavy equipment to construct them);
- 19 2. the fire hose method is much more precise in its application and is less likely to
20 adversely impact sensitive species directly or indirectly; and
- 21 3. the fire hose method allows much greater control and flexibility over the timing and
22 location of applications; and
- 23 4. the fire hose method can be applied in small increments and lends itself to an adaptive
24 management approach.

25 Although there are uncertainties to the fire hose method, the dike option has similar
26 uncertainties in addition to the substantial adverse effects and difficulty in application.
27 Therefore, the fire hose method is proposed as a preferred alternative method to achieve habitat
28 renewal.

29 **1.0 WOOLLY STAR PRESERVE AREA (WSPA) DIVERSION DIKE**
30 **MITIGATION PLAN**

31 The purpose of the proposed plan (identified as Option 1 in the Seven Oaks Dam BA) is to
32 replicate pre-dam hydraulic processes and habitat renewal below Seven Oaks Dam to enhance
33 and maintain suitable alluvial scrub habitat for target endangered species within the Woolly
34 Star Preserve Area (WSPA). This plan is designed to combine re-operation of the dam with the
35 construction of artificial structures to flood lands, replicate overbank flooding, and promote
36 habitat renewal, within the WSPA. Major components of the project include:

- 1 1. re-operation of Seven Oaks Dam;
- 2 2. construction of temporary diversion dikes within the main channel;
- 3 3. creation of a sediment management plan and monitoring plan; and
- 4 4. construction of protective dikes around the WSPA (See pages 237 to 244 of the Seven
- 5 Oaks Dam BA).

6 The water control plan for Seven Oaks Dam is designed to achieve flood control objectives only.
7 The dam operation would be modified to provide water to allow implementation of this
8 mitigation measure. The revised operation would be tailored to work as part of the multi-
9 species Habitat Management Plan (HMP) without creating adverse impact on the flood control
10 function of Seven Oaks Dam. When significant flood inflow into the darn occurs, floodwaters
11 are initially stored, while a small release (500 cfs or less) is made until the reservoir pool level at
12 Prado Dam begins to recede. Water stored at Seven Oaks Dam is then released at higher rates to
13 evacuate the reservoir pool for subsequent flood events. Releases of water from Seven Oaks
14 Dam will also be made so as to not impact water rights of downstream users.

15 The proposed mitigation plan is designed to flood lands within the WSPA. With re-operation
16 of the dam, water stored in the dam could be held until temporary diversion dikes could be
17 constructed, provided weather and runoff forecasts were suitable. Reservoir releases could then
18 be diverted into the historic small breakout areas adjacent to the main channel. It is assumed
19 that the cost associated with the re-operation of Seven Oaks Dam is negligible. The advantage
20 associated with the re-operation plan is that it would provide relatively natural flooding
21 processes, but in a controlled way, to minimize the impact associated with reduction in those
22 processes resulting from Seven Oaks Dam. The disadvantage is that impacts would occur
23 related to the controlled flooding, construction of temporary water diversion dikes, protective
24 dikes, and in providing for sediment management recharge in the river.

25 **1.1 PLAN FEATURES**

26 In addition to re-operation of the dam, the project would require the periodic construction of
27 temporary diversion dikes from channel bed material to divert main channel flow onto the
28 WSPA lands. Table 1 provides a summary of the structural and non-structural components for
29 the proposed plan. Dikes would be constructed within the main river channel inside or
30 immediately adjacent to the WSPA. Placement of the dikes would involve consultation with the
31 USFWS, qualified biologists, and engineers to maximize flow benefits while avoiding and
32 minimizing potential adverse biological impacts.

33 The dikes would be made by pushing existing bed material with bulldozers into a dike pile that
34 would be approximately 400 feet long, 40 to 50 feet wide at the base, and about 10 feet high (2 to
35 1 slope). Each dike would cover a 0.5-acre footprint, and approximately two acres of channel
36 would be disturbed for each dike. No compacting of the dike would be done, and it would be
37 expected to erode with flood flows. Any remaining dike would be taken down to return the
38 channel to its preexisting grade after the controlled release. Temporary dike construction would
39 not result in degradation of the channel. Only one to two dikes would be constructed at a time,
40 at a frequency of approximately every five to ten years.

1 Figure E7-1 (adapted from the BA) illustrates the conceptual locations of dikes and resulting
 2 overflow areas associated with implementation of this plan. However, decisions regarding the
 3 actual locations of controlled releases will depend upon decisions made once results from the
 4 directed and experimental studies are complete and qualified biologists review potential
 5 locations with hydrologists. Locations of release would be possible in other areas within the
 6 WSPA (e.g., different configuration than shown on Figure 50 in USGS Section 12) and/or on
 7 Conservation District lands adjacent to the WSPA and that extend south of the river channel.

8 **Table 1. Summary of Structural and Non-Structural Considerations**
 9 **for Seven Oaks Dam Re-Operation Plan (Option 1).**

Consideration	Footprint and Duration
Diversion Dikes on Santa Ana River	
Assumptions: Work location in active channel; construction to occur after flood event and after peak on Mill Creek; access from existing roads; bulldozer, front loader, and 10-ton dump truck used for construction	
Time required to construct each diversion dike:	1 to 2 days
Santa Ana River diversion dikes about 400-feet long by 40- to 50-feet wide by 10-feet high (2:1 slopes). Maximum size of footprint per dike:	0.5 acres
Size of area scraped to create each Santa Ana River diversion dike. Assumed excavation depth of about 2 feet:	2 acres
Approximate size of overflow footprint per controlled release (magnitude of 1,000 to 2,000 cfs):	10 acres
Number of Santa Ana River diversion dikes per controlled release:	1 or 2 at most
Total number of Santa Ana River diversion dikes over project life (100 years):	20
Total size of target flow area along Santa Ana River:	200 acres
Woolly Star Protective Dike	
Assumptions: Dike location within WSPA; construction to occur outside flood season; access to WSPA from existing roads; construction will require creation of new access routes within WSPA; bulldozer, front loader, and 10-ton dump truck used to construct dike; materials brought onto site and no excavation within WSPA.	
Size of WSPA protective dike (2:1 slopes) , maximum size of footprint:	30 acres
Access and work zone (in addition to dike) estimated to be length by 30-feet wide. Footprint of additional construction zone:	17 acres
Time required to construct WSPA protective dike:	3 to 5 months
Sediment Management	
Assumptions: Sand would be infrequently placed in the river to increase sediment supply for overflow deposition during re-operation controlled releases; work location within active channel; access from existing roads; bulldozer, front loader, and 10-ton dump truck used to move sand.	
Location of conveyor belt would be downstream of Seven Oaks Dam along the river alignment approximately 4,000 feet downstream. Total on-ground footprint from conveyor belt system 4,000-feet long by 20-feet wide. Size of footprint:	2 acres
Size of area covered by sand in river:	10 acres
Frequency of sand recharge to river:	10 to 20 years
Time required for conveying sand to river:	6 months
Alternatively, time required to truck and spread sand in the river would occur over a six-month period infrequently.	
<i>Source: USACE 2000.</i>	

1 A conceptual re-operation plan (Option 1) is described below to provide an example of the type
2 of considerations that will be addressed in assessing level of potential benefit and disturbance to
3 areas selected for habitat management. On Figure E7-1, the westernmost flow area (closest to
4 San Bernardino International Airport) is about 40 acres in size, the middle area (south of the
5 sand and gravel mining area) is about 31 acres in size, and the easternmost area (north of
6 Redlands Municipal Airport) is about 127 acres in size. Thus, about 200 acres would be subject
7 to target flows from the temporary diversion dikes. Based on engineering judgment, it was
8 assumed that 25 percent of the flow target area would be rejuvenated during each controlled
9 flow release (about 10 acres of area with one temporary dike). Flows would follow topography
10 and occupy existing and historic flow paths. It would take several (about 20) controlled releases
11 over the life of the project to provide flows to the entire area to be renewed. Small training dikes
12 constructed in association with the larger diversion dike could be used to direct flows to
13 different locations. The smaller training dikes could be constructed by hand using shovels and
14 would have a typical footprint of about 0.1 acre. Diverted flows during the controlled release
15 would deposit sediment within existing flow paths within the flood target area.

16 Sand would be recharged into the Santa Ana River below the dam to the confluence of Mill
17 Creek as part of a sediment management plan for the river. It was assumed that the sand would
18 be either conveyed to the river by a conveyor belt system running from the dam, excavated
19 from behind the dam and trucked to the river on access roads, and/or would be provided by
20 the Conservation District. Regardless of the source, the sand that is returned to the river would
21 have the same physical characteristics as under Pre-dam conditions. A conveyor belt system, if
22 used, would be located on cleared land (about 4,000 feet long by 20 feet wide) next to the river
23 alignment and extend from the dam to approximately 4,000 feet downstream. It was assumed
24 that any right-of-way necessary to traverse Bureau of Land Management (BLM) land would be
25 obtained at no cost to Federal or Local Sponsor agencies. Alternatively, sand would be
26 conveyed to the river by trucks on existing roads. Sand would be spread over about a 10-acre
27 area in the river channel by bulldozer. Sand would be recharged to the river every 10 to 20 years
28 over the life of the project. During a sediment management year, sand placement would occur
29 over about a six-month period.

30 A protective levee would be constructed to prevent water from flowing onto lands outside the
31 WSPA not held in Conservation District ownership. The levee could be up to about 25,000 feet
32 long, 40- to 50-feet wide at the base, and about 10-feet high. The purpose of this protective levee
33 would be to ensure that any flows diverted from the main channel onto the overbank areas
34 would not inundate areas to which the USACE does not have legal rights to flood. During the
35 design and/or implementation stages, it may be possible to reduce the extent and dimensions
36 of the protective levee by use of training berms and experience gained during implementation
37 of controlled releases.

38 Refinement and full evaluation of different alternatives for the sediment management plan and
39 levee design will be addressed in a supplemental EIS regarding implementation of mitigation
40 and enhancement measures for Seven Oaks Dam.

1.2 IMPACTS ASSOCIATED WITH THE DIVERSION DIKE PLAN

1.2.1 Santa Ana River Woolly Star

1.2.1.1 *Acreage and Location Considerations*

The WSPA covers 764 acres. It is estimated that the area of managed habitat would be about 200 acres with the re-operation plan. The management would consist of hydraulic deposition of sand within pre-existing flow channels within that larger area. Therefore, a range of successional habitats would be maintained within the overall enhanced area.

The above acreage value can only be estimated because the areas of the various successional stages of RAFSS mapped for purposes of the BA are not exactly the same as those mapped specifically for woolly star and represented in the woolly star Management Plan. This issue is particularly relevant to Reach 5, where one diversion dike is proposed. This area is occupied primarily by early surfaces, as documented in an update to the terrace map prepared for the Management Plan in 1999. The 1988 distribution map shows a sizeable population of woolly stars already in this area. However, the vegetation habitat map shows this area as an intermediate surface. It would be advisable to resolve this discrepancy through field investigation before placement of a dike in Reach 5. If it is verified that this area consists of early fluvial surfaces and continues to support woolly stars, placement of the dike in Reach 5 should be postponed until habitat monitoring indicates action should be taken.

The diversion dikes proposed for the re-operation plan are all located in, and would largely affect, only the WSPA. Most of the estimated acreage of intermediate and late successional habitat outside of the overflow target area that would no longer be flooded during 50- to 100-year flow events, as a result of dam re-operation, is distributed across Reaches 1 and 2, outside of the WSPA. The late successional area of RAFSS within a fragment of the WSPA, located along Plunge Creek and Greenspot Road, would also be unaffected by the overflows, but this area is outside of the impact zone of the Seven Oaks Dam and would not be expected to flood frequently even under Pre-dam hydrologic conditions. It is possible that the areas not targeted for habitat renewal would have been, and would continue to be, favored by woolly star pollinators for breeding, but this possibility cannot be evaluated without additional pollinator data.

1.2.1.2 *Factors Potentially Affecting Successful Habitat Renewal*

Potential effectiveness of the options in renewing woolly star habitat within the target areas relates to the extent of scour expected from the overflows and the extent to which new sand would be deposited. The extent of new scour is expected to be minimal because the overflows would be confined within existing channels. Competing species adjacent to the channels would still have an opportunity to proliferate unless the depth of sand favored woolly stars at the expense of these competing species. For example, annual grasses generally compete more successfully on fine grained sand and less successfully on deep coarse grained sand. Therefore the extent to which new sand deposition would favor woolly stars will likely depend on depth of the sand, and whether or not competing species such as annual grasses colonize the new sand. Results from the habitat renewal experiments, conducted as part of implementation of the WSPA Management Plan, should provide good information for final design of this option.

1 **1.2.1.3** *Factors Affecting Colonization of Renewed Habitat by Woolly Star*

2 Habitat renewal alone, in terms of its physical characteristics, does not guarantee that woolly
3 stars would colonize these areas unassisted. Such colonization will depend on two factors,
4 namely the reproductive health of existing woolly star populations, and proximity of these
5 populations to the renewed areas. Data collected previously for development of the WSPA
6 Management Plan indicate that the reproductive health of populations is entirely dependent on
7 the abundance of certain types of pollinators, and that average seed dispersal distances from
8 adult plants are probably small, on the order of six feet, unless these seeds are carried by
9 overland sheet flow into new areas. The mapped 1988 distribution of woolly star populations in
10 relation to the target areas for Option 1 indicates that adjacent woolly star populations may be
11 insufficient in size to serve as adequate sources of natural seed dispersal into the renewed areas.
12 Therefore salvage of seeds from plants in non-renewal areas would be required to improve
13 probability of success of the re-operation plan.

14 **1.2.1.4** *Potential for Construction-Related Impacts*

15 There is potential for construction-related impacts on existing woolly stars associated with
16 establishing the dikes. This is of particular concern with construction of a protective dike within
17 the WSPA. Such impacts would need to be addressed through field surveys prior to
18 construction, in order to avoid or at least minimize take of existing woolly star plants and their
19 habitat. If take is anticipated, seeds from reproductive individuals should be salvaged for
20 distribution onto the renewed fluvial surfaces.

21 **1.2.2** **Slender-Horned Spineflower**

22 **1.2.2.1** *Acreage and Location Considerations*

23 Approximately 151 acres of occupied spineflower habitat in USGS Section 12 overlaps with the
24 WSPA. This area can be included in the re-operation plan if rejuvenation of spineflower habitat
25 is deemed necessary at some point during the life of the project. There is also overlap of
26 approximately 35 acres of occupied spineflower habitat with a section of WSPA that intersects
27 Orange Street (western grouping of spineflower occurrences) that could also be incorporated
28 into the re-operation plan.

29 **1.2.2.2** *Factors Potentially Affecting Successful Habitat Renewal*

30 It is important to emphasize that in any of the areas where flooding would be reintroduced,
31 indirect negative impacts will occur if there is inappropriate management of overflows such
32 that rejuvenation occurs unnecessarily or prematurely in high quality spineflower habitat where
33 viable populations exist. If the re-operation plan is appropriately designed to consider that
34 rejuvenation requirements for spineflower may be different from SBKR or woolly star, then the
35 plan would have a beneficial effect on the species. In this context, it is certainly possible that
36 historical overflows that have benefited woolly star and SBKR may have eliminated spineflower
37 populations, but this might not have a net adverse effect if sufficient suitable habitat and
38 repopulation occurred in other areas. Also, spineflower may colonize areas formerly suitable for
39 woolly star. These relationships are an important consideration in proposing areas for flooding,

1 in USGS Section 12 within the WSPA or in areas along the main channel that are adjacent to
2 occupied spineflower habitat.

3 Moreover, despite the role that flooding plays in maintaining suitable habitat conditions for
4 spineflower, it is plausible that the species may persist throughout the life of the project without
5 flood rejuvenation, and that other measures discussed in Sections 8.3.3 and 8.3.4 of the USACE
6 BA, such as removal of grasses and other dense vegetation or irrigation may provide more
7 benefit.

8 Insofar as cumulative impacts are concerned, the other projects occurring within the area of
9 concern and their effect on spineflower and its habitat that were described in Section 7.3.2
10 would be the same for the Post-dam versus Re-operation scenario. The contribution of Seven
11 Oaks Dam to cumulative effects associated with re-operation may be less than those described
12 for Post-dam (2000) conditions because of the potential benefit that flooding rejuvenation may
13 have on the species within the WSPA in USGS Section 12. The key aspect of achieving benefit
14 will depend on results of directed studies and careful consideration of spineflower habitat
15 requirements in the placement of any diversion or protection dikes.

16 While the effort in defining the re-operation plan is to understand and mimic a complex process
17 that involves several environmental variables, in the end the most likely management response
18 to this problem is close monitoring and flexible implementation of the re-operation plan and
19 any other mitigation measure.

20 **1.2.2.3 *Factors Affecting Colonization of Renewed Habitat***

21 Given the limited habitat area for spineflower and lack of information about germination and
22 dispersal processes, it is questionable whether their seeds will be deposited in potentially
23 suitable habitat or that the release event will bring new seeds to establish at the site. This may
24 also be important if it is impossible to develop a controlled release plan that is compatible with
25 all three species and it is necessary to prematurely rejuvenate spineflower habitat. The
26 feasibility and details of establishing seed banks will need to be determined, and salvage of
27 seeds from plants in non-renewal areas may be required to improve the probability of success of
28 a re-operation option.

29 **1.2.2.5 *Potential for Construction-Related Impacts***

30 There is the potential for direct adverse impacts to spineflower if the placement of structures
31 required for the re-operation plan, such as protective dikes, does not consider the location of
32 occupied spineflower habitat. This could potentially occur in small areas in the western and
33 eastern (USGS Section 12) groupings of spineflower occurrences, although it cannot be
34 quantified because the exact placement of these structures is unknown at this time.

35 **1.2.3 *San Bernardino Kangaroo Rat***

36 **1.2.3.1 *Acreage and Location Considerations***

37 Hydraulic renewal within about 200 acres of scrub habitat is slightly more than the impact
38 estimate of about 169 acres of overflow difference between the January 1998-dam and Post-dam

1 conditions. The location of impact predominantly occurs along the river channel, and along the
2 historic cross-fan flow channels in USGS Section 12 (some of which is within the WSPA).
3 Therefore, hydraulic renewal of lands within the WSPA that will no longer be flooded under
4 higher magnitude floods has the potential to benefit SBKR if the directed studies indicate
5 population and habitat decline due to succession and that decline coincides with a substantial
6 difference in predicted overflows between Pre- and Post-dam conditions.

7 **1.2.3.2 *Factors Potentially Affecting Successful Habitat Renewal***

8 Similar to woolly star, the potential effectiveness of the re-operation plan in renewing habitat
9 relates to the extent of scour (to open up areas of bare ground) and extent to which new sand
10 would be deposited. The extent of new scour is expected to be minimal because the overflows
11 would be confined within existing channels. Non-native grasses that may lower habitat quality
12 may still have the opportunity to proliferate unless the depth of sand was sufficient to smother
13 those plants. Therefore, the extent to which new sand deposition would favor SBKR will likely
14 depend on depth of the sand, and whether or not competing species such as non-native grasses
15 colonize the new sand. Results from the habitat renewal experiments, conducted as part of
16 implementation of the multi-species HMP, should provide good information on the
17 effectiveness of the re-operation plan.

18 **1.2.3.3 *Factors Affecting Colonization of Renewed Habitat***

19 Habitat renewal alone, in terms of its physical characteristics, does not guarantee that SBKR
20 would colonize the enhanced areas. Such colonization will depend on several factors, the
21 proximity of source populations to the enhanced areas, dispersal rates, presence of suitable
22 movement corridors, and the quality of intervening habitat. Those types of factors will require
23 study during the directed studies and during the course of implementation to answer those
24 questions.

25 **1.2.3.4 *Potential for Construction-Related Impacts***

26 SBKR have the potential to be directly and indirectly impacted by the re-operation plan.
27 Benefits to the population may be realized by enhancing habitat towards a higher quality to the
28 species. Construction of dikes has the potential to result in direct loss or disturbance of
29 individuals. Controlled flooding also has the potential to result in losses due to individual
30 drowning. Spreading sand within the channel for sediment recharge also has the potential to
31 result in direct losses to individual animals. Prior to implementation of a re-operation event, a
32 pre-construction survey would be required to estimate occupancy within the areas of
33 disturbance, and recommendations made to avoid and minimize incidental take of the species.
34 Exclusionary fencing and translocation of small mammals have been implemented elsewhere to
35 lessen large-scale “temporary” impacts and to assist in maintaining genetic diversity (USACE
36 2000), and may be appropriate to consider.

37 A concern with controlled flooding would be to avoid any net loss of occupied habitat. Due to
38 the fragmented and limited nature of occupied habitat, the risk of inducing population decline
39 is a serious concern and steps would need to be taken to avoid irreparable harm to the species.

1 **1.2.4 Coastal California Gnatcatcher**

2 Most of the hydrological effects associated with the re-operation plan would be contained in
3 Subarea 2. With the operation of the darn, changes in habitat associated with reduced flood
4 flows “may affect, but not likely to adversely modify” critical habitat for the gnatcatcher. The
5 re-operation plan would provide habitat renewal and slow succession, which would diminish
6 the potential to affect critical habitat. Construction elements (e.g., protective dike), if permanent,
7 have the potential to result in a loss of critical habitat for the species and would require
8 consideration. Use of temporary dikes would result in temporary disturbance. The impact to the
9 species from construction would not be expected to result in a significant impact to the
10 population given that the habitat is at the extreme distributional range of the species, and no
11 records of breeding are known for the area. Potential impacts during construction would need
12 to be assessed by performing surveys to determine presence of this species in the affected area;
13 and if gnatcatchers are present, construction activity should be scheduled between August 15
14 and February 1, which is outside the breeding season. No habitat for gnatcatchers occurs within
15 Subarea 3; therefore, re-operation would have “no effect” on the species within this
16 downstream reach of the river.

17 **1.2.5 Least Bell Vireo**

18 Most of the hydrological effects associated with the re-operation plan would be contained in
19 Subarea 2, where vireo habitat is largely lacking. Re-operation options would have “no effect”
20 on vireo within Subarea 2. Periodic increased flows downstream through Subarea 3 would be
21 expected to have only a minimal hydrologic effect, therefore, re-operation would not change the
22 “may affect, not likely to adversely affect” determination for vireo and its critical habitat in
23 Subarea 3.

24 **1.2.6 Southwestern Willow Flycatcher**

25 Most of the hydrological effects associated with the re-operation plan would be contained in
26 Subarea 2, where flycatcher habitat is lacking. Re-operation options would have “no effect” on
27 flycatcher within Subarea 2. Periodic increased flows downstream through Subarea 3 would be
28 expected to have only a minimal hydrologic effect, therefore, re-operation would not change the
29 may affect, not likely to adversely affect” determination for flycatcher and its critical habitat in
30 Subarea 3.

31 **1.2.7 Arroyo Southwestern Toad**

32 No impacts occur to this species from operation; similarly none are expected from re-operation.

33 **1.2.8 California Red-legged Frog**

34 No impacts occur to this species from operation; similarly none are expected from re-operation.

35 **1.2.9 Santa Ana Sucker**

36 Most of the hydrological effects associated with the re-operation plan would be contained in
37 Subarea 2, where suitable Santa Ana sucker habitat is lacking; however, this area is part of

1 designated critical habitat (USFWS 2004). The re-operation plan would have “no effect” on
2 Santa Ana sucker or its habitat within Subarea 2. Periodic increased flows downstream through
3 Subarea 3 would be expected to have an insignificant hydrologic effect in replacing former
4 hydrological conditions, therefore, re-operation would not change the “may affect, not likely to
5 adversely affect” determination for Santa Ana sucker in Subarea 3.

6 **2.0 WOOLLY STAR PRESERVATION AREA FIRE HOSE SCOUR**
7 **MITIGATION METHOD**

8 An alternative method to mitigate for decreased overbank flooding consists of scouring habitat
9 areas with water using a fire hose. The intent would be to restore habitat for SBKR and SARWS
10 by using high pressure water to remove vegetation and leave freshly deposited sand and silt,
11 thus simulating the habitat-renewing aftermath of natural flooding. Muni/Western will
12 develop this program in coordination with USFWS and CDFG. Water would be piped or
13 trucked by Muni/Western to areas of suitable habitat with a combination of permanent and
14 temporary piping. A high pressure nozzle would be directed at localized areas of habitat
15 determined to be suitable for SBKR and SARWS after renewal. The nozzle would be hand-
16 operated or operated from a light-vehicle.

17 For estimating purposes, 10-acre parcels were broken into 15ft² (3ftX5ft) blocks for the hose
18 treatment. A one-person hose operation was assumed, which would be limited to 95 gallons per
19 minute (GPM) (SBCFD, 2003). Table 2 presents the total time and amount of water that would
20 be needed to treat the 10-acre parcels.

21 The estimated amount of water necessary for scouring a 10-acre parcel using the fire hose
22 ranges from 1.4 to 2.8 acre-feet. This number contrasts the 4,000 to 16,000 acre-feet (1000 cfs for
23 2 days to 2000 cfs for 4 days) that are need for habitat scouring by diverting water from the SAR
24 through the construction of temporary dikes.

25 With the fire hose treatment, many aspects of renewal activities can be carefully controlled and
26 systematically varied, ideal for an experimental approach to habitat manipulation. Relatively
27 small areas can be treated at one time and the results tracked to allow adaptive management. In
28 addition, it enables specific areas to be targeted and nearby areas to be avoided, enabling
29 manipulation to be done while avoiding populations or individuals of sensitive species or areas
30 of sensitive habitat. As with the dike mitigation, it may be necessary to augment existing
31 sediments with importation of sand to accomplish project objectives but with the fire hose
32 approach the sand can be introduced on a small scale and applied precisely. Treatments would
33 be accomplished in a randomized block design to allow experimental testing of variables such
34 as duration and intensity of spray, addition of clean sand, season of disturbance, and
35 application of seed vs. allowing natural dispersal. A rigorous monitoring program funded by
36 Muni/Western would be established to enable the differences among experimental treatments
37 to be determined. The program would be adjusted appropriately as results from earlier efforts
38 become available. The design and implementation of the ongoing effort would be funded by
39 Muni/Western and conducted by representatives of Muni/Western with the approval of the
40 USFWS and CDFG.

41

Table 2. Habitat Scouring with Fire Hose

	<i>Range of Treatment</i>	
Flow Rate (gpm)	95	95
Pressure (psi)	100	100
Time/Section (sec)	10	20
Water/ 1ft ² (gal/ft ²)	1	2
Number of 15ft ² -Blocks per Acre	2,904	2,904
TO TREAT 1-ACRE		
Working Time (min)	484	968
Rest Time (min)	70	160
Setup Time (min)	60	60
Total Time (hr)	10.2	19.8
Amount of Water (gal)	45,980	91,960
TO TREAT 10 ACRES (AC)		
Total time for 10 AC (hr)	102	198
Total Water for 10 AC (ac-ft)	1.41	2.82

1 **References Cited**

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- 7 USFWS (U.S. Fish and Wildlife Service). 2004. *Final Rule to Designate Critical Habitat for the*
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9 CFR Part 17. February.

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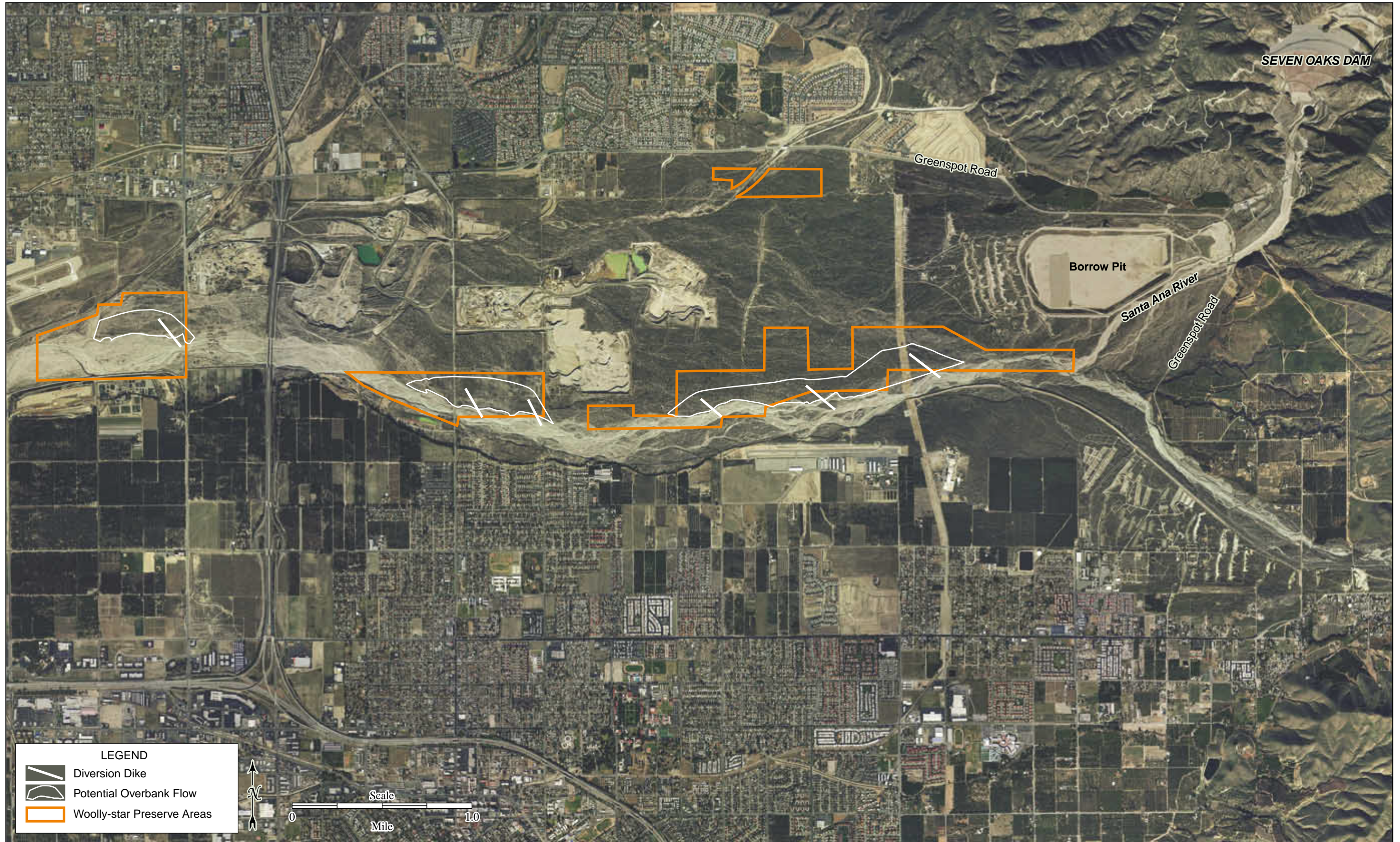


Figure E-7-1. Diversion Dikes along the Woolly-star Preserve