APPENDIX B: USFWS DRAFT BIOLGICAL OPINION

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United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Fish and Wildlife Office
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In Reply Refer to:
23-0014690-S7-F-LA

June 18, 2024
Sent Electronically

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Subject: DRAFT Biological Opinion for the California High Speed Rail Palmdale to Burbank Section, Los Angeles County, California

Dear Stefan Galvez-Abadia, Aaron Allen, Roman Torres, Paul Rodriquez, and Diana Wood:

This document was prepared in accordance with section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 *et seq.*) in response to correspondence from the

California High Speed Rail Authority (Authority or CHSRA) dated November 17, 2023, requesting consultation for the California High Speed Rail Palmdale to Burbank Section and its potential effects on the federally threatened coastal California gnatcatcher (*Polioptila californica californica*; gnatcatcher), the federally endangered least Bell's vireo (*Vireo bellii pusillus*; vireo), southwestern willow flycatcher (*Empidonax traillii extimus*; flycatcher), slender-horned spineflower (*Dodecahema leptoceras*), and arroyo toad {a. southwestern t. [*Anaxyrus californicus* (*Bufo microscaphus c.*)]; arroyo toad} and its designated critical habitat. The project is receiving Federal funding through the Federal Railroad Administration (FRA). The Authority has assumed the Federal Railroad Administration's (FRA) responsibilities under the Act for this consultation in accordance with Section 1313, Surface Transportation Project Delivery Program, of the Moving Ahead for Progress in the 21st Century Act (MAP-21) of 2012, as described in the National Environmental Policy Act (NEPA) assignment Memorandum of Understanding between FRA and the State of California (effective July 23, 2019) and codified in 23 U.S.C. 327. This biological opinion is also provided to the U.S. Army Corps of Engineers (Corps) to address their proposed issuance of a permission decision under section 404 of the Clean Water Act (CWA) and section 408 of the Rivers and Harbors Act of 1899, the Angeles National Forest of the U.S. Forest Service (USFS or Forest) and the Bureau of Land Management (BLM) because the project crosses Forest and BLM lands, and the Surface Transportation Board (STB) because they will be overseeing the project once it has been constructed. The Authority is the designated lead Federal agency for consultation under section 7 of the Endangered Species Act of 1973 (Act), as amended (16 U.S.C. 1531 et seq.). We initiated consultation on November 17, 2023, the day we received the Authority's request for consultation. Additional information was provided by the Authority on December 14, 2023.

Based on conservation measures committed to by the Authority, we concur with your determination that the proposed project is not likely to adversely affect the federally endangered Braunton's milk-vetch (*Astragalus brauntonii*), Nevin's barberry (*Berberis nevinii*), spreading navarretia (*Navarretia fossalis*), California Orcutt grass (*Orcuttia californica*), unarmored threespine stickleback (*Gasterosteus aculeatus williamsoni*), mountain yellow-legged frog (*Rana muscosa*), California condor (*Gymnogyps californianus*), and the federally threatened vernal pool fairy shrimp (*Branchinecta lynchi*), California red-legged frog (*Rana draytonii*), desert tortoise (*Gopherus agassizii*), and yellow-billed cuckoo (*Coccyzus americanus*), and the proposed endangered Coastal-Southern California distinct population segment of the California spotted owl (*Strix occidentalis occidentalis*), (Appendix 1). Therefore, these species are not addressed by this biological opinion.

This biological opinion is based on information provided in: (1) *California High-Speed Rail Authority Palmdale to Burbank Project Section Biological Assessment* (BA; CHSRA 2023); (2) your November 17, 2023, correspondence requesting initiation of consultation; and (3) other sources of information including survey reports and email correspondence. A complete project file of this consultation is maintained at the Carlsbad Fish and Wildlife Office (CFWO).

CONSULTATION HISTORY

Early coordination between the Authority and the Service occurred on the project. The following chronology reflects a summary of significant events:

2015-2023	A series of monthly coordination meetings was held between the Authority, the Service, and other regulatory agencies. A broad range of topics was discussed, including the project's purpose and need, selection criteria, range of alternatives, habitat modeling, project operation and maintenance, groundwater impacts from tunneling, avoidance of Una Lake, and wildlife corridors.
2015-2016	A working group was established to discuss species habitat models and a series of meetings was held between the Authority, the Service, the USFS, and the California Department of Fish and Wildlife (CDFW).
January 25, 2017	A field meeting was held between the Authority, the Service, the CDFW, and the USACE at the location where the project will cross the Santa Clara River.
September 24, 2018	The Authority presented an overview of the State's preferred alternative (Refined SR14 Build Alternative) to the Service and other regulatory agencies.
January 19, 2021	The Authority provided the Service with an administrative Draft Environmental Impact Report / Environmental Impact Statement (DEIR/EIS) for the project for review and comment.
February 26, 2021	The Service provided comments on the administrative DEIR/EIS.
June 30, 2021	The Authority provided the Service with a draft Biological Assessment for the project for review and comment.
September 17, 2021	The Service provided comments on the draft Biological Assessment.
September 2, 2022	The Authority circulated the DEIR/EIS for the project for public comments.
December 1, 2022	The Department of the Interior, including the Service, sent comments on the DEIR/EIS for the project.
February 16, 2023	The Authority obtained a list of federally threatened and endangered species and their critical habitats expected to be present in or near the proposed action area from the Service's Information, Planning, and Conservation System (IPaC).

June 1, 2023	The Authority sent a revised Biological Assessment and request to initiate formal consultation under section 7 of the Act to the Service.
June 30, 2023	The Service sent a response letter declining the request to initiate section 7 consultation due to insufficient information, including a lack of information about anticipated impacts to slender-horned spineflower, discrepancies in effects determinations for federally listed species, and lack of clarity about proposed conservation measures.
August 1, 2023	The Authority and the Service met to discuss the concerns raised in the Services response letter.
August 9, 2023	The Authority and the Service met to discuss slender-horned spineflower.
August 22, 2023	The Authority and the Service met to discuss coastal California gnatcatcher.
September 1, 2023	The Authority and the Service met to discuss coastal California gnatcatcher mitigation opportunities.
September 22, 2023	The Authority sent a revised Biological Assessment and request to initiate formal consultation under section 7 of the Act to the Service.
September 29, 2023	The Authority withdrew the request to initiate formal consultation under section 7 of the Act to make further revisions to the Biological Assessment.
November 17, 2023	The Authority sent a revised Biological Assessment and request to initiate formal consultation under section 7 of the Act to the Service.
May 29, 2024	The Service provided a draft biological opinion to the Authority, Corps, BLM, USFS, and STB for review.
May 31-June 6, 2024	The Authority, Corps, BLM, and STB provided minor comments on the draft biological opinion, which are addressed in this biological opinion.
June 17, 2024	The USFS responded to the draft biological opinion, noting that the USFS anticipates working with the Authority and Service consistent with conservation measure "CM-GEN-25: Implement the Water Resources Adaptive Management and Monitoring Plan" to develop an adaptive management and monitoring plan prior to project implementation. This plan will be implemented to validate the determinations in this biological opinion regarding potential effects to listed species and their critical habitats.

DESCRIPTION OF THE PROPOSED ACTION

The project includes construction, operation, and maintenance of the approximately 38-mile Palmdale to Burbank section of the proposed 800-mile California high speed rail (HSR) system, with electric propulsion and steel-wheel-on-steel-rail trains capable of operating speeds up to 220 miles per hour on a dedicated system of fully grade-separated, access-controlled steel tracks.

While the Final Environmental Impact Statement for the project included several alternatives, section 7 consultation has been requested for the construction, operation, and maintenance of the SR14A Build Alternative with Adit 3 and Intermediate Window 1 (Figure 1), which includes the following design features and elements (Figures 2-6):

- Six profile types: at-grade, at-grade covered, cut and cover, retained cut/trench, tunnel, and elevated/aerial structure.

- Grade-separated crossings with roads, railroads, and other transportation facilities.

- Equipment storage areas, temporary and permanent access roads, train signaling and communication facilities, intrusion protection barriers (to prevent derailed trains or errant vehicles from adjacent transportation facilities from entering the HSR corridor), and wildlife crossing structures.

- Utility relocations, roadway relocations, electrical power connections, and construction staging areas.

- An adit (intermediate tunnel access shaft intended to facilitate construction of bored tunnels) and an intermediate window (vertical shaft connecting to an underground construction area that would include an elevator and gantry cranes to provide access to water, power, ventilation, and other support during construction).

- A station site in Burbank, including passenger boarding/alighting platforms; station head house with ticketing, waiting areas, passenger amenities, vertical circulation (e.g., ramps, stairs, escalators), administration and employee areas, and baggage and freight-handling service; vehicle parking (short-term and long-term); pick-up and drop-off areas; motorcycle/scooter parking; bicycle parking; waiting areas and queuing space for taxis and shuttle buses; and pedestrian walkway connections.

- Traction power substations (to transform high-voltage electricity supplied by public utilities to the voltage necessary for operating the train) generally 220 by 160 feet in size, approximately every 30 miles, with two along the Palmdale to Burbank project section.

- Switching stations (to connect and balance the electrical load between tracks and switch power on or off tracks in the event of a power outage or emergency) generally 120 feet by 80 feet in size, located in between traction power substations, with one proposed along the Palmdale to Burbank project section.

- Paralleling stations (to provide voltage stabilization and equalize electric current flow) generally 120 feet by 80 feet in size, located every 5 miles, with nine proposed along the Palmdale to Burbank project section.

- An overhead contact system for distributing power to trains that will consist of a series of mast poles every 70 to 200 feet, approximately 23.5 feet higher than the top of the rail.

- Communication towers and ancillary facilities for positive train control (a safety system designed to automatically implement safety protocols and provide communication with other trains to reduce the risk of a potential collision) generally 20 by 15 feet in size at traction power substations, or 25 by 40 feet standing alone, located every 2 to 3 miles.

The Authority was unable to obtain permission to enter all properties within the action area and, therefore, could not conduct habitat assessments and biological surveys along much of the proposed alignment. Instead, species habitat suitability modeling was conducted, and modeled habitat for listed species was used to quantify the impacts of the project and identify potential mitigation opportunities in the region. Impacts of the Palmdale to Burbank Section of the California High Speed Rail Project to modeled habitat for listed species, and mitigation to offset these impacts, are quantified below in Table 1. Project impacts to designated critical habitat for the arroyo toad are quantified below in Table 2. Impacts to modeled habitat for the gnatcatcher, vireo, flycatcher, slender-horned spineflower, and arroyo toad are shown in Figures 7-11. Impacts to arroyo toad critical habitat are shown in Figure 12.

Table 1. Impacts to Modeled Habitat and Mitigation.[1]

Modeled Habitat	Permanent Impacts (acres)	Mitigation for Permanent Impacts (acres)	Temporary Impacts (acres)	Mitigation for Temporary Impacts (acres)[2]	Total Impacts (acres)	Total Mitigation (acres)
Coastal California Gnatcatcher Primary Habitat	222.1	444.2	16.4	32.8	238.5	477

Modeled Habitat	Permanent Impacts (acres)	Mitigation for Permanent Impacts (acres)	Temporary Impacts (acres)	Mitigation for Temporary Impacts (acres)[2]	Total Impacts (acres)	Total Mitigation (acres)
Coastal California Gnatcatcher Secondary Habitat	200	200	0	0	200	200
Coastal California Gnatcatcher Total	**422.1**	**644.2**	**16.4**	**32.8**	**438.4**	**677[3]**
Least Bell's Vireo Core Breeding Habitat and Breeding Habitat	0	0	3	3	3	3
Least Bell's Vireo Recolonization Breeding Habitat	6.0	18	0	0		18
Least Bell's Vireo Total	**6**	**18**	**3**	**3**	**9**	**21**
Southwestern Willow Flycatcher Potentially Suitable Habitat / Total	**6**	**12**	**3**	**3**	**9**	**15**
Arroyo Toad Breeding Habitat	5.0	10	0	0	5	10
Arroyo Toad Upland / Aestivation Habitat	40.0	80	22.0	22.0	62	102
Arroyo Toad Permeable Movement Area	16.5	0	12.5	12.5	29	12.5

Modeled Habitat	Permanent Impacts (acres)	Mitigation for Permanent Impacts (acres)	Temporary Impacts (acres)	Mitigation for Temporary Impacts (acres)[2]	Total Impacts (acres)	Total Mitigation (acres)
Arroyo Toad Total	**61.5**	**90**	**34.5**	**34.5**	**96**	**124.5**
Slender-Horned Spineflower Core Suitable Habitat	31.5	63	13.7	27.4	45.2	90.4
Slender-Horned Spineflower Potentially Suitable Habitat	104	104	1.3	1.3	105.3	105.3
Slender-Horned Spineflower Total	**135.5**	**167**	**15**	**28.7**	**150.5**	**195.7[4]**

[1] Definitions of modeled habitat categories are included in Appendix 2 of this biological opinion.
[2] Mitigation for temporary impacts will include on-site restoration.
[3] 677 acres of gnatcatcher mitigation is proposed. Of this total, 503.3 acres will be conserved in advance of project impacts in accordance with CM-CAGN-03, and the remainder will be conserved prior to the completion of construction.
[4] 195.7 acres of slender-horned spineflower mitigation is proposed. Of this total, 143 acres will be conserved in advance of project impacts in accordance with CM-PLT-03, and the remainder will be conserved prior to the completion of construction.

Table 2. Impacts to Arroyo Toad Critical Habitat

	Permanent (acres)	Temporary (acres)	Mitigation (acres)[2]
With PBFs[1]	2.4	0	4.8
Lacking PBFs	0	0	0
Total	2.4	**0**	**4.8**

[1.] The designation of critical habitat (CH) for the arroyo toad uses the term "primary constituent element" (PCE) to refer to the physical and biological features within critical habitat that are essential to the conservation of the species. The new critical habitat regulations (81 FR 7214) replace this term with physical or biological features (PBFs). The shift in terminology does not change the approach used in conducting this effects analysis, which is the same regardless of whether the original designation identified PCE, PBF, or essential features. In this consultation, we use the term PBF to mean PCE.

[2] Of the 124.5 acres of mitigation proposed for arroyo toad in Table 1, 4.8 acres will be located within critical habitat.

Conservation Measures

The Authority has agreed to implement avoidance and minimization measures in association with the project (Appendix 3). We consider the measures in the Appendix to be part of the action, and our analysis assumes they will be implemented.

Action Area

Regulations implementing the Act (50 CFR § 402.02) describe the action area as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action. Subsequent analyses of the environmental baseline, effects of the action, and levels of incidental take are based upon the action area. For this project, we have defined the action area to be the project footprint and surrounding habitat that may be exposed to project-related effects such as increased noise, light, dust levels and human activity during project construction, including a 100-foot buffer for plant species, a 250-foot buffer for vernal pool species, and a 1,000-foot buffer for wildlife species (Figure 13).

In addition, the action proposes offsite mitigation. While this consultation includes an analysis of impacts resulting from restoration of temporary impact areas and incorporates measures to avoid and minimize impacts to listed species from restoration work, and we do not have site-specific information for offsite mitigation at this time. A mitigation plan will be prepared and provided to the CFWO for review and approval prior to initiation of vegetation removal for the project. This plan will include site-specific information on listed species and critical habitats and will incorporate the avoidance and minimization measures used for restoration of temporary impact areas for the project as appropriate. However, if offsite mitigation will result in impacts to listed species and/or critical habitats that are not adequately addressed by incorporation of these project measures, the Authority will reinitiate section 7 consultation to address unanticipated impacts to listed species and critical habitats.

ANALYTICAL FRAMEWORK FOR THE SECTION 7(A)(2) DETERMINATIONS

Jeopardy Determination

Section 7(a)(2) of the Act requires that Federal agencies ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of listed species. "Jeopardize the continued existence of" means to engage in an action that reasonably would be expected, directly or indirectly, to reduce appreciably the likelihood of both the survival and recovery of a listed species in the wild by reducing the reproduction, numbers, or distribution of that species (50 CFR § 402.02).

The jeopardy analysis in this biological opinion relies on four components: (1) the Status of the Species, which describes the range-wide condition of the species, the factors responsible for that condition, and its survival and recovery needs; (2) the Environmental Baseline, which analyzes the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species; (3) the Effects of the Action, which are all consequences to listed species caused by the proposed action that are reasonably certain to occur; and (4) the Cumulative Effects, which evaluate the effects of future, non-Federal activities in the action area on the species.

For the section 7(a)(2) determination regarding jeopardizing the continued existence of the species, the Service begins by evaluating the effects of the proposed Federal action and the cumulative effects. The Service then examines those effects against the current status of the species to determine if implementation of the proposed action is likely to reduce appreciably the likelihood of both the survival and recovery of the species in the wild.

STATUS OF THE SPECIES / CRITICAL HABITAT

Coastal California Gnatcatcher

The gnatcatcher occurs in coastal sage scrub and associated habitats from southern Ventura County to Baja California, Mexico. In 1993, the Service estimated that about 2,562 gnatcatcher pairs remained in the United States, with the highest densities occurring in Orange and San Diego counties (Service 1993). In a recent study using more rigorous sampling techniques, Winchell and Doherty (2008) estimated there were 1,324 (95 percent confidence interval: 976–1,673) gnatcatcher pairs over a 111,006-acre area on public and quasi-public lands in Orange and San Diego counties. Their sampling frame covered only a portion of the U.S. range, focusing on the coast, and was limited to 1 year. Although it is not valid to extrapolate beyond the sampling frame, especially in light of known differences in population densities across the range of the gnatcatcher (Atwood 1992), it is likely there are more gnatcatchers in the U.S. portion of the range than was suggested by earlier estimates; Winchell and Doherty (2008) estimated nearly as many gnatcatchers in the portion of the U.S. range sampled in their study as was originally estimated for the entire U.S. range. We are not aware of any recent estimates of gnatcatcher populations in Baja California.

Although declines in numbers and distribution of the gnatcatcher have resulted from numerous factors, the current significant threats to the gnatcatcher include habitat fragmentation and degradation, which can lead to type conversion (Service 2020). Several stressors, including livestock grazing, anthropogenic atmospheric pollutants, and wildland fire, can lead to type conversion of gnatcatcher habitat. As regional Habitat Conservation Plans (HCPs) permitted under section 10(a)(1)(B) of the Act and under the State of California's Natural Community Conservation Planning (NCCP) Act are implemented over time, an increasing amount of habitat will receive beneficial management that will address these threats. Although implementation of NCCP/HCPs is in the process of reducing the threats identified above, habitat type conversion continues to be a threat. Therefore, the gnatcatcher continues to meet the definition of threatened, and no change in listing status was made following our 5-year review (Service 2020).

For more detailed information on gnatcatcher biology, ecology, rangewide status, threats, and conservation needs, please refer to the 5 year review for the species (Service 2020).

Least Bell's Vireo

Vireos breed and forage in low-elevation riparian woodland and shrub habitat dominated by willows (Service 2006) and tend to return to the same breeding territories annually (Rourke and Kus 2007). Most of the vireo breeding sites are in southern California between the Tehachapi Mountains in Kern and Ventura counties south to northwestern Baja California, Mexico (Service 2006). A review of the status of the vireo in 2006 determined that management actions implemented since the original listing have led to a 10-fold increase in the vireo population since its listing in 1986, from 291 to 2,968 known territories (Service 2006). Based on its improved status, the Service recommended that the vireo be downlisted from endangered to threatened status (Service 2006). More recent surveys conducted in 2016 came up with a similar estimate of 2,884 vireo territories (Kus et al. 2017).

In addition to the threats identified at the time of listing, a disease complex involving two species of ambrosia beetles, the polyphagous shot hole borer (*Euwallacea* sp. 1) and Kurushio shot hole borer (*Euwallacea* sp. 5), a mix of associated fungi (Lynch et al. 2016), and other pathogens is causing damage to trees in riparian ecosystems throughout southern California (Eskalen et al. 2013). Significant mortality of mature trees related to this threat may alter vireo prey availability, increase exposure to predation (especially for vireo nests), and affect hydrogeomorphic processes (e.g., flooding, alluvial deposition) important for maintaining healthy riparian woodlands that vireos use for feeding, sheltering, and breeding. It is not clear whether the effects of shot hole borer infestations will result in long-term impacts to least Bell's vireo habitat. For example, there has been riparian vegetation regrowth in the affected portions of the Tijuana River, and while the regrown trees have not been reinfested by shot hole borers, there is concern that they may in the future (Boland and Uyeda 2020).

Within the 14 Population/Metapopulation Units designated in the draft recovery plan, the following areas have the greatest number of vireos in order of number: Camp Pendleton/Santa Margarita River (827 territories), Santa Ana River (813 territories), and the San Luis Rey River (233 territories) (Service 2006). The primary goals of the draft recovery plan are to: (1) maintain

stable or increasing vireo metapopulations, each consisting of several hundred or more breeding pairs; (2) protect and manage riparian and adjacent upland habitats within the historic range of the vireo; (3) control non-native plant species; (4) control brown-headed cowbird (*Molothrus ater*; cowbird) parasitism; and (5) conduct habitat restoration.

For more detailed information on vireo biology, ecology, rangewide status, threats, and conservation needs, please refer to the draft recovery plan for the vireo (Service 1998) and the 5-year review for the species (Service 2006).

Southwestern Willow Flycatcher

The breeding range of the flycatcher includes most of the southwestern United States (Unitt 1987, Browning 1993) with data from 1993 to 2005 indicating that flycatcher breeding territories ranged from Arizona (40.8 percent) to New Mexico (32.4 percent), California (15.7 percent), Nevada (5.6 percent), Colorado (5.2 percent), and Utah (0.3 percent) (Durst et al. 2006). Past records of breeding in Mexico are few and confined to extreme northern Baja California and Sonora (Howell and Webb 1995). Flycatchers winter in Mexico, Central America, and northern South America (Howell and Webb 1995).

Although the breeding range extends through six states, Kus and Sogge (2003) noted that southwestern willow flycatchers have declined to the point of near extinction as urbanization and burgeoning human populations have resulted in widespread loss and degradation of riparian habitat. Flycatchers have been dramatically reduced in number along the lower Colorado River, which historically probably supported one of the largest flycatcher populations in the Southwest (Unitt 1987). Durst et al. (2006) reported 1,214 territories located among 275 sites rangewide within the United States using data from 1993 to 2005.

Over the range of the species, most (83 percent) of the breeding sites are small, both in terms of population size (five or fewer territories) and habitat patch size (Durst et al. 2006). Only 17 percent of the sites rangewide have more than five territories. Seven of these sites (populations) consist of 20 or more territories, and only two sites have 50 or more territories. The primary flycatcher drainages in California are the San Luis Rey River (58 territories), the Santa Ana River (34 territories), the Owen's River (28 territories), the Santa Margarita River (21 territories), and the Kern River (20 territories) (Durst et al. 2006).

The rangewide population of flycatcher has not experienced the significant increase in numbers since its listing that the vireo population has experienced. This may be a byproduct of the flycatchers need for mature vegetation (greater than 8 years old), their need for nearby open water, the reduced benefit that cowbird trapping provides the flycatcher, and/or an unknown stressor in the flycatcher's overwintering habitat.

For more detailed information on flycatcher biology, ecology, rangewide status, threats, and conservation needs, please refer to the recovery plan for the flycatcher (Service 2002) and the 5-year review for the species (Service 2017).

Arroyo Toad and its designated Critical Habitat

An estimated 23 populations of arroyo toad are known in the United States, from Monterey County south to Baja California, Mexico (Service 2009). These populations persist primarily as small, isolated populations in the headwaters of streams. The current distribution of the arroyo toad in the United States is from the Salinas River Basin in Monterey County, south to the Tijuana River and Cottonwood Creek Basin along the Mexican Border. Arroyo toads are also known from a seemingly disjunct population in the Arroyo San Simeon River System, about 10 miles (mi) southeast of San Quintín, Baja California, Mexico (Gergus et al. 1997). Although the arroyo toad occurs principally along coastal drainages, it also has been recorded at several locations on the desert slopes of the Transverse range (Patten and Myers 1992, Jennings and Hayes 1994).

Arroyo toads typically breed from February to July on streams with persistent water (Griffin et al. 1999). Eggs hatch in 4 to 5 days, and the larvae are essentially immobile for an additional 5 to 6 days. Larvae then begin to disperse from the pool margin into the surrounding shallow water, where they spend an average of 10 weeks. After metamorphosis (June–July), the juvenile toads remain on the bordering gravel bars until the pool no longer persists (usually from 8 to 12 weeks depending on site and yearly conditions; Sweet 1992).

During the non-breeding season, arroyo toads seek shelter during the day, and other periods of inactivity, by burrowing into the sandy areas of upland terraces. They also use the marginal zones between stream channels and upland terraces for burrowing, especially during late fall and winter (Sweet 1992). Upland habitats frequently used include, but are not limited to, chaparral, native and non-native grasslands, and oak woodlands (Service 1999). Disturbed areas with friable (loose) soils may also be used for aestivation/foraging. At night, arroyo toads forage in the habitat surrounding a watercourse for native ants and beetles (Service 1999). Juveniles and adult toads may range up to 1.2 miles from the watercourse into the surrounding uplands (Service 1999). In addition, arroyo toads have been observed to move 0.7–0.8 mile in a stream course within a season (Service 2005).

Threats to arroyo toad populations at the time of listing included stream alteration, urban and rural development, mining, recreation, grazing, drought, wildfire, large flood events, and presence of exotic animal and plant species (Service 1994). Threats to the arroyo toad identified after the listing are the amphibian chytrid fungus (*Batrachochytrium dendrobatidis*) and wildfire suppression activities (Service 2009). Conservation needs, as described in the arroyo toad recovery plan, include protecting and managing breeding and non-breeding habitat throughout the range of the species, monitoring existing populations to ensure recovery actions such as removal of exotic species are successful, identifying additional arroyo toad habitat and populations, obtaining research data to guide management efforts, and conducting outreach and public education regarding the arroyo toad.

For more detailed information on arroyo toad biology, ecology, rangewide status, threats, and conservation needs, please refer to the species' recovery plan (Service 1999) at and the most recent 5-year review for this species (Service 2023).

Final critical habitat for the arroyo toad was designated on February 9, 2011 (Service 2011). The critical habitat encompasses approximately 98,366 acres of lands located in Santa Barbara, Ventura, Los Angeles, San Bernardino, Riverside, Orange, and San Diego counties, California (Service 2011). Twenty-one critical habitat units have been designated for the arroyo toad. The project is located within designated arroyo toad critical habitat Unit 6, and Subunit 6c. This unit is in Los Angeles County and includes 2,802 acres including 443 acres of Federal land and 2,359 acres of private land. Subunit 6c encompasses approximately 11 miles of the upper Santa Clara River from Arrastre Canyon downstream to the confluence with Bee Canyon Creek. This subunit is important for maintaining the arroyo toad metapopulation in the upper Santa Clara River Basin. The physical and biological features essential to the conservation of the species in this subunit may require special management considerations or protection to address threats from urban development, agriculture, recreation, mining, and nonnative predators (Service 2011).

Physical and biological features (PBFs) of arroyo toad critical habitat include rivers or streams with hydrologic regimes that supply water to provide space, food, and cover needed to sustain eggs, tadpoles, metamorphosing juveniles, and adult breeding arroyo toads; riparian habitats for breeding and rearing of tadpoles and juveniles and adjacent uplands including areas of loose soil where arroyo toads can burrow underground that provide foraging and living areas for juvenile and adult arroyo toads; a natural flooding regime; and stream channels and adjacent upland habitats that allow for movement to breeding pools, foraging areas, overwintering sites, upstream and downstream dispersal, and connectivity to areas that contain suitable habitat (Service 2011).

Slender-horned Spineflower

Slender-horned spineflower is an annual plant in the buckwheat family (*Polygonaceae*). This species is small, cryptic, and low spreading, with a basal rosette of leaves 1 to 4 inches in diameter (Hickman 1993). Flowers are white with a pinkish-red midvein and are produced in clusters within an involucre (whorl of bracts). The involucres of slender-horned spineflower have six ascending and six descending awns; a characteristic that separates them from closely related taxa (Reveal and Hardham 1989).

Slender-horned spineflower is generally associated with alluvial benches and floodplain terraces in washes and lower slopes of mountains below 2,300 feet in elevation, in chaparral and alluvial scrub vegetation. Alluvial scrub is characterized by an open vegetation community of drought-deciduous and evergreen shrubs on porous, infertile soils subject to periodic intense flooding and erosion. The species inhabits openings in intermediate and mature Riversidean alluvial fan sage scrub, where disturbance from flooding is less frequent. The species relies upon adequate alluvial scrub habitat and active fluvial processes. Prigge et al. (1993) found that the ideal habitat appears to be a terrace or bench that receives overbank deposits every 50 to 100 years.

At most sites, slender-horned spineflower is found in sandy soil in association with mature alluvial scrub (Reveal and Hardham 1989a, Rey-Vizgirdas 1994). Cryptogamic crusts are frequently present in areas occupied by slender-horned spineflower (Boyd and Banks 1995). These crusts on the soil surface are composed of associations of bryophytes (mosses), algae, lichens, and some xerophytic liverworts (Harper and Marble 1988). Cryptogamic crusts enable

soils to retain moisture and may help suppress invasion by non-native plant species (Boyd and Banks 1995).

Perennial vegetative cover is low (less than 50 percent) in areas supporting slender-horned spineflower (Service 1987), although vegetative cover of annuals and cryptogamic crusts can be 100 percent (Ferguson 1999). The species occurs in open areas within a plant community characterized by old California juniper (*Juniperus californicus*), Yerba Santa (*Eriodictyon californicum*), mountain mahogany (*Cercocarpus betuloides*), yucca (*Yucca Brevifolia*), and other low-statured annuals such as sun-cups (*Camissonia* sp.), goldfields (*Lasthenia* sp.), branched woolly sunflower (*Eriophyllum multicaule*), and plantains (*Plantago* sp.) (Service 1987, Ferguson 1999).

Slender-horned spineflower is a spring annual that typically germinates in late February or early March in response to winter rains (Ferguson 1999). Plants begin flowering in late spring and continue into early summer until heat and drought induce senescence. The number of plants germinating and surviving to reproduction varies considerably from year to year depending on the amount and timing of rainfall.

This species is endemic to southwestern cismontane California, ranging from central Los Angeles County east to San Bernardino County, and south to southwestern Riverside County in the foothills of the Transverse and Peninsular Ranges, at approximately 650 to 2,300 feet in elevation (Hickman 1993). Historically, slender-horned spineflower was reported to occur in many of the alluvial systems on the coastal side of the transverse range in Los Angeles and San Bernardino counties, and at the base of the interior slopes of the Agua Tibia mountains in Riverside County (Service 1987). Many of these alluvial fans coalesced into extensive bajada to form a nearly continuous skirt along these mountains.

There are 28 extant or presumed extant slender-horned spineflower populations, including three in Los Angeles County, 15 in Riverside County, and 10 in San Bernardino County (Service 2022). Of these, only 15 populations have been observed in the past 10 years, including 1 population in Los Angeles County [Bee Canyon, CNDDB Element Occurrence (EO) 27], 8 populations in Riverside County (EOs 1, 16, 21, 23, 24, 44, 45, and 46), and 6 populations in San Bernardino County (EOs 2, 22, 30, 32, 39, and a population with no CNDDB record at Greenspot Road).

Threats to slender-horned spineflower include development, sand and gravel mining, altered hydrology, off-highway vehicle activity, nonnative invasive plants, trash dumping, camping and associated activities, small population size, and climate change (Service 2022). The primary conservation needs for the species include the preservation of alluvial scrub habitats and the associated watershed and floodplain areas needed to maintain active fluvial processes, with active management to prevent trampling and degradation of cryptogamic crusts and invasion by nonnative grasses.

For more detailed information on slender-horned spineflower biology, ecology, rangewide status, threats, and conservation needs, please refer to the 5-year review for the species (Service 2022).

ENVIRONMENTAL BASELINE

The regulations implementing the Act (50 CFR § 402.02) define the environmental baseline as the condition of the listed species or its designated critical habitat in the action area, without the consequences to the listed species or designated critical habitat caused by the proposed action. The environmental baseline includes the past and present impacts of all Federal, State, or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impact of State or private actions which are contemporaneous with the consultation in process. The consequences to listed species or designated critical habitat from ongoing agency activities or existing agency facilities that are not within the agency's discretion to modify are part of the environmental baseline (50 CFR § 402.02).

Site Characteristics and Surrounding Land Uses

At the north end, the project alignment begins in Antelope Valley, on the western edge of the Mojave Desert, near the southern city limits of the city of Palmdale. The alignment passes east of Una Lake and south across the San Andreas Fault and Governor Edmund G. Brown East Branch California Aqueduct. Then it continues southwest into the San Gabriel Mountains. The alignment crosses the Santa Clara River, tunnels under the Angeles National Forest, and follows Pacoima Wash south. The alignment crosses Tujunga Wash in the vicinity of the Hansen Spreading Grounds and ends at the Hollywood Burbank Airport (Figure 1).

The action area passes through diverse terrain, including relatively flat high desert habitats in the north, mountainous areas in the center of the project alignment, and flat urban landscapes in the south. Habitat types in the vicinity of the project include desert scrub, Joshua tree (*Yucca brevifolia*), and juniper (*Juniperus californica*) woodland at the northern base of the San Gabriel Mountains, chamise-redshank chaparral (*Adenostoma fasciculatum* and *Adenostoma sparsifolium*, respectively), mixed chaparral, juniper (*Juniperus californica*), sage scrub, riparian and coast live oak (*Quercus agrifolia*) woodlands, as well as disturbed and urban areas.

Status of Listed Species and Critical Habitat Within the Action Area

Coastal California gnatcatcher

Gnatcatcher surveys were not conducted for the project, but there are records for gnatcatchers within the action area from 2008 and 2012. Gnatcatchers were observed in coastal sage scrub and alluvial scrub habitats in the vicinity of Bee Canyon north of the Santa Clara River. In 2008, a pair with a juvenile were observed on the slopes east of Bee Canyon approximately 0.6 mile north of the Santa Clara River (Environmental Intelligence, LLC 2008). In 2012, two gnatcatcher pairs and an unpaired female were observed. Both pairs were located on the slopes east of Bee

Canyon, approximately 0.5 mile and 0.75 mile north of the Santa Clara River, and the northern pair was observed with 4 fledglings. The unpaired female was observed on the slopes west of Bee Canyon approximately 0.9 mile north of the Santa Clara River (Compliance Biology 2008). Assuming the unpaired female represents a potential pair/territory, up to three gnatcatcher pairs may occur in the action area.

Least Bell's vireo

Vireo surveys were not conducted for the project, but vireos have been detected in and adjacent to the action area in the vicinity of Una Lake, Pacoima Wash, and the Santa Clara River. The California Natural Diversity Database (CNDDB) includes a record from 2005 at Una Lake, just west of the project alignment. There are 16 records for vireos (with up to 4 territories in a breeding season) between 2004 and 2016 in Pacoima Wash in the vicinity of the Lopez Reservoir and Dam, east of a tunneled portion of the project alignment and about 2,500 feet southwest of a project staging area (PCR Services Corporation 2004, BonTerra Consulting 2005, 2009, 2010, 2011, 2013, BonTerra Psomas 2015, 2016). Finally, a vireo was heard singing in 2023 just east of the project alignment where it crosses the Santa Clara River (Dellith 2023, pers. obs.).

Southwestern willow flycatcher

Flycatcher surveys were not conducted for the project, but the CNDDB includes a flycatcher record from 1997 in the Santa Clara River approximately 2.9 miles east of the project alignment. There is also a record from 2009 at Hansen Flood Control Basin, approximately 1.25 miles northeast of the project alignment (BonTerra Consulting 2009).

Arroyo toad and its designated critical habitat

Arroyo toad surveys were not conducted for the project, but the CNDDB includes an arroyo toad record from 2001 in the Santa Clara River approximately 0.75 mile east of the project alignment. Approximately 2.4 acres of critical habitat for the arroyo toad occurs within the permanent impact area for the project.

Slender-horned spineflower

A single day survey was conducted for the project in alluvial scrub habitat in the lower part of Bee Canyon in 2023 with negative results (Rincon Consultants, Inc. 2023). Detectability of this annual species varies considerably from year to year as the number of individuals that germinate depends on the amount and timing of rainfall. The surveyors did not detect the species at their reference population despite a thorough search, and the survey report states that abnormal rainfall patterns and extreme temperature fluctuations may have affected the blooming period, making observation challenging (Rincon Consultants, Inc. 2023). There is a CNDDB record for slender-horned spineflower within 20 feet of the project footprint in Bee Canyon from 2017. Suitable alluvial scrub habitat also occurs within the project footprint in Pacoima Wash where there is a CNDDB record from 1925, approximately 2 miles to the south, and no recent surveys have been conducted.

EFFECTS OF THE ACTION

Regulations implementing the Act (50 CFR § 402.02) define the effects of the action as all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur but for the proposed action and it is reasonably certain to occur. Effects of the action may occur later in time and may include consequences occurring outside the immediate area involved in the action (50 CFR § 402.17).

The regulations for section 7(a)(2) note that "a conclusion of reasonably certain to occur must be based on clear and substantial information, using the best scientific and commercial data available" [50 CFR § 402.17(a)]. When considering whether activities caused by the proposed action (but not part of the proposed action) or activities reviewed under cumulative effects are reasonably certain to occur, we consider factors such as (1) past experiences with activities that have resulted from actions that are similar in scope, nature, and magnitude to the proposed action; (2) existing plans for the activity; and (3) any remaining economic, administrative, and legal requirements necessary for the activity to go forward.

Invasive Species

The project could result in an increase in the introduction of invasive plant species into native habitats adjacent to the facility. Invasive species are now recognized as a threat to biodiversity in native plant communities, second only to direct habitat loss and fragmentation (Pimm and Gilpin 1989, Scott and Wilcove 1998). Non-native, weedy species often out-compete and exclude native species, potentially altering the structure of the vegetation, degrading or eliminating habitat utilized by listed species, and providing food and cover for undesirable non-native animals (Bossard et al. 2000). The project has incorporated measures to prevent the spread of invasive species. These include CM-GEN-03: Prepare and Implement a Weed Control Plan, and CM-GEN-14: Clean Construction Equipment. This is anticipated to minimize the impact of invasive species introduction resulting from the project on listed species habitat to the point where such effects are insignificant.[1]

Disruption of Ecosystem Processes Due to Habitat Fragmentation

The project has the potential to substantively increase habitat fragmentation, which can lead to a variety of direct and indirect effects to native species in the vicinity of the proposed project (e.g., Crooks and Soule 1999). The facility will create an east-west barrier to dispersal between the San Gabriel Mountains and portions of the transverse ranges farther west. The project has incorporated measures to address habitat fragmentation. A Wildlife Corridor Assessment Technical Report (Authority 2019) has been prepared to ensure wildlife connectivity is maintained throughout the project area, which will help to maintain ecosystem processes (e.g., by maintaining dispersal opportunities for top predators) for the benefit of listed species. This

[1] For the purposes of a section 7 consultation, an insignificant effect is one that is sufficiently small that a person would not be able to meaningfully measure, detect, or evaluate it.

report includes recommended wildlife crossing spacing intervals of 1.0 mile for large crossings and 0.3 mile for small crossings. In coordination with the Service during section 7 consultation, wildlife crossings were incorporated into the project design in the vicinity of Una Lake, and project elements (e.g., detention basins) were redesigned to minimize impacts to wildlife movement corridors in northern reaches of Bee Canyon. In addition, measures will be implemented to ensure that the project does not result in substantial habitat fragmentation. These include CM-GEN-11: Delineate Equipment Staging Areas and Traffic Routes, CM-GEN-17: Minimize Effects to Wildlife Movement Corridors during Construction, and CM-GEN-18: Establish Wildlife Crossings. Implementation of the Wildlife Corridor Assessment Technical Report and these measures are anticipated to minimize the impact of habitat fragmentation on ecosystem processes affecting listed species to the point where such effects are insignificant. The effects of habitat fragmentation on individual listed species and their habitat are addressed in the species-specific analyses below.

Sedimentation, Dust, Pollution from Project Construction

Project construction may increase fugitive dust, pollution, and siltation in the adjacent habitat as a result of grading, sediment moving, and operation of heavy equipment in proximity to the Santa Clara River, Una Lake, Pacoima Wash, and other drainages. Increased dust, sedimentation, and pollution may temporarily degrade habitats occupied by listed species. The project has incorporated measures to minimize these impacts to listed species habitat. A SWPPP (CM-GEN-05) will be developed to identify best management practices that will be implemented during construction to minimize erosion and dust, prevent sediment and debris from entering drainages, and maintain water quality. To avoid increases in pollution, a spill prevention plan (CM-GEN-06) will be prepared and implemented, and Worker Environmental Awareness Program (WEAP) training will be conducted (CM-GEN-07, CM-GEN-08). With implementation of these measures, we anticipate the effects of construction dust, pollution, and sedimentation on listed species will be minimized to the point where such effects are insignificant.

Increased Access, Human Encroachment

The project may result in increased access during construction and project operations. While the facility will be access controlled, during project construction there will be an influx of human activity in the project area, and project operations will require maintenance, and increased human activity is expected along the proposed maintenance access roads. This increased access could result in human encroachment into adjacent habitat areas, resulting in trampling and increased wildfire risk. Measures have been incorporated into the project to minimize the impacts of increased access on listed species. These include CM-GEN-07: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training, and CM-GEN-15: Establish Environmentally Sensitive Areas and Non-Disturbance Zones. In addition, much of the project site is adjacent to areas of existing development, such as SR-14 and the Cities of Palmdale and Burbank. With the proposed measures, any increase in habitat degradation associated with these factors is expected to be insignificant.

Light Spill from Construction and Operational Lighting

Some project work will be conducted at night with construction lighting that will affect the adjacent habitat. Light that alters natural light patterns in ecosystems can lead to increased predation, disorientation, and disruption of inter-specific interactions (Longcore and Rich 2004). Light can affect a broad range of plant physiological responses as well, including seed germination, seedling development, induction of flowering, and rapid, membrane-based activities (Hopkins 1995). The project has incorporated measures to minimize the effects of lighting on listed species. These include CM-GEN-21: Implement Avoidance of Nighttime Light Disturbance, CM-GEN-23: Design the Project to be Bird Safe, and CM-Light-01: Minimize Light Disturbance During Operations. With implementation of these measures, we anticipate the effects of project lighting on listed species will be minimized to the point where such effects are insignificant.

Noise and Vibrations from Project Construction and Operation

Noise and vibrations associated with the use of heavy equipment during project construction, and from trains during project operations, have the potential to disrupt avifaunal behaviors in adjacent habitats by masking intraspecific communication and startling birds (e.g., see Dooling and Popper 2007 for a discussion of observed effects of highway noise on birds). A 3 dBA (hourly average) increase in noise has been shown to correspond to a 50 percent reduction in listening area for birds due to masking (Barber et al. 2009). In addition, the project will result in periodic high pulses of noise and vibrations from passing trains, which may result in a flushing effect on individual birds. The project has incorporated measures to minimize the effects of noise and vibrations on listed species. These include CM-GEN-26: Minimize Permanent, Intermittent Noise Impacts on Special-Status Bird Habitat, and CM-CAGN-02: Implement Avoidance Measures for Coastal California Gnatcatcher. CM-GEN-26 requires the construction of 14-foot-tall noise barriers in areas with modeled listed species habitat to reduce noise effects from project operations (Figure 13). While these measures are designed to minimize noise impacts to listed species, project operations will result in permanent impacts within a noise effect zone, and those permanent impacts are addressed in the species-specific analyses below.

Wildlife Strikes from High-Speed Rail Operation

Once the high-speed rail is in operation, there is the potential for the train to strike and kill wildlife, including gnatcatcher, vireo, flycatcher, and arroyo toad. However, the project will include 14-foot-high noise barriers wherever above-ground portions of the track are in proximity to habitat for federally listed bird species. In addition, exclusion fencing will be constructed on either side of at-grade portions of the track to prevent terrestrial wildlife, including arroyo toad, from entering the tracks. With these barriers, the potential for federally listed wildlife to be struck and killed during project operations will be discountable (highly unlikely to occur).

Coastal California Gnatcatcher

The project will permanently affect 222.1 and 200 acres of modeled primary and secondary gnatcatcher habitat, respectively (a total of 422.1 acres, including 16.5 acres of permanent noise

impacts). Temporary impacts will occur to 16.4 acres of modeled primary gnatcatcher habitat (Table 1). These impacts are located as shown in Figure 7, with much of the gnatcatcher impact area in the vicinity of Bee Canyon. Surveys have documented up to three gnatcatcher pairs/territories within the action area in the vicinity of Bee Canyon (Compliance Biology 2008). These gnatcatchers will be subjected to the loss of a substantial portion of their use areas.

The project has incorporated conservation measures to avoid and minimize impacts to gnatcatchers. In areas occupied by gnatcatchers, active nests will be avoided with a 500-foot no-work buffer (CM-CAGN-01, CM-CAGN-02). Vegetation removal for the project will be conducted under the supervision of the Designated Biologist between September 1 and February 14, which is outside of the gnatcatcher breeding season, to ensure that gnatcatchers are not directly killed or injured (CM-GEN-01, CM-GEN-02, CM-CAGN-01, CM-CAGN-02). In addition, areas occupied by gnatcatchers outside and adjacent to the construction limits will be designated as Ecologically Sensitive Areas (ESAs) on project maps. ESAs will be marked during construction in a manner that is clearly visible to personnel on foot or operating heavy equipment (CM-GEN-15).

Although habitat removal will be conducted outside the gnatcatcher breeding season, gnatcatchers are non-migratory territorial birds, and removal of a substantial portion of a gnatcatcher pair's breeding territory will force the pair to expand their existing territory or establish a new territory (Preston et al. 1998). Because gnatcatchers are distributed throughout much of the suitable habitat in the vicinity of Bee Canyon, it is likely that the gnatcatchers affected by habitat loss within their primary use areas will be forced to compete with resident gnatcatchers when attempting to expand an existing territory or establish a new territory. Because these displaced birds likely will be less able to find suitable habitat to forage and shelter in, we anticipate they will be more vulnerable to predation and otherwise may die or be injured.

Gnatcatchers that successfully establish territories in adjacent habitat are expected to experience reduced productivity (e.g., delayed initiation or prevention of nest building, fewer nesting attempts per season, and/or overall reduction in reproductive output) due to reduced availability of foraging and breeding habitat and increased territorial interactions. In addition, we anticipate that the gnatcatchers will be subject to disturbance from construction activities.

Within the 16.5-acre area of permanent noise impacts, operational noise could result in displacement and reproductive loss for the gnatcatcher pairs. Displaced gnatcatchers may also be subjected to increased predation, death, or injury and may not be able to find sufficient nearby habitat or may be forced to compete with other gnatcatchers when attempting to expand an existing territory or establish a new territory. Occupancy and reproductive productivity are anticipated to decline within the noise effect zone.

The project will provide 677 acres of mitigation for gnatcatchers. Of this, 503.3 acres will be conserved in advance of project impacts, and at least 50 percent of the advanced mitigation will be occupied. This mitigation will be located primarily in the geographic area of the species' northeastern range. If the required amount of suitable mitigation habitat is not available in the northeastern extent of the species range, additional mitigation lands may be conserved along the

Santa Clara River west of I-5 (CM-CAGN-03). A mitigation plan will be prepared and provided to the CFWO for review and approval prior to initiation of vegetation removal for the project (CM-Mit-01). Due to the limited gnatcatcher numbers in the northeastern extent of the species range, once the plan has been approved by the CFWO, a minimum of 503.3 acres of the proposed conservation will be secured, and any off-site restoration work on those lands will commence in advance of project impacts to minimize the temporal loss of gnatcatcher habitat. Because the acreage of conservation relative to restoration of gnatcatcher habitat is not known, it is difficult to anticipate the net effect of the project on the gnatcatcher population rangewide. However, even if the offsite mitigation is limited to conservation and long-term management, the enhancement of existing habitat (e.g., through removal of non-native species) is likely to increase the value of the conserved habitat such that the net effect of the project on the gnatcatcher population rangewide is likely to be neutral. If the offsite mitigation includes significant habitat restoration in addition to conservation and long-term management, the project is likely to have a net positive effect on the gnatcatcher population rangewide.

The project will impact gnatcatchers and their habitat in the vicinity of Santa Clarita. This area represents the northeastern extent of the gnatcatcher's range. The gnatcatcher population in the vicinity of Santa Clarita is patchily distributed relative to other portions of its range, so anticipated impacts to up to three gnatcatcher pairs represents a more biologically meaningful impact than it would in other portions of its range. However, large areas of modeled habitat will remain in the vicinity of Santa Clarita, and the conservation or restoration and management of 677 acres of gnatcatcher habitat, which will be located primarily in the northeastern extent of its range and at least 251.7 acres of which will be occupied by gnatcatchers, will substantially limit future threats to the conserved habitat and/or expand the amount of habitat and number of gnatcatchers that can be supported within this portion of its range. In addition, the impacts will occur along the edge of modeled habitat within the vicinity of Santa Clarita (Figure 7), so it is not anticipated to bisect a large area of suitable habitat. Finally, since the track will be tunneled as it runs the through the Angeles National Forest, impacts to gnatcatcher through the forest (assuming such dispersal occurs) will not be substantially impacted, and dispersal through modeled habitat west of the forest will not be impacted.

In summary, implementation of the proposed project will result in permanent impacts to 438.6 acres of modeled gnatcatcher habitat and is likely to result in a short-term reduction in the number of gnatcatchers supported in the action area (up to three gnatcatcher pairs) due to the direct loss of a portion of their habitat. If they survive the initial habitat loss, they may be subject to breeding season disturbance that could lead to displacement, reproductive loss, increased predation, death, or injury. The gnatcatcher pairs to be impacted represent less than 0.2 percent of the rangewide estimate of gnatcatcher pairs (roughly 2,562 pairs). With implementation of offsetting mitigation in advance of project impacts and within the northeastern extent of the species range, the project is not anticipated to reduce the number of gnatcatchers that can be supported in the general project area or increase the local risk of gnatcatcher extirpation. Thus, the project is not expected to result in an appreciable reduction in the numbers, reproduction, or distribution of the species rangewide.

Habitat Restoration

The mitigation plan for the project will include restoration of temporary impacts to 16.4 acres of sage scrub habitats suitable for gnatcatcher breeding. It may be 4 to 5 years until restored sage scrub is suitable for occupation by gnatcatchers (O'Connell and Erickson 1998, Miner et al. 1998). However, because offsite mitigation located in the vicinity of the project will be implemented in advance of project impacts, we anticipate that gnatcatcher pairs will remain in the surrounding area. Thus, we expect the temporarily impacted habitat will be re-occupied as soon as it is mature enough to support gnatcatcher breeding.

Habitat restoration planting and maintenance is expected to benefit gnatcatchers, but it may also result in disturbance of gnatcatchers that are adjacent to the restoration site, or that move into the site as restoration progresses. However, the project includes conservation measures to minimize disturbance of gnatcatchers during restoration work and to ensure that no nests are destroyed as a result of maintenance activities (CM-Rest-01).

Effect on Recovery

There is no recovery plan for the gnatcatcher, but the project is consistent with the general recovery goals of maintaining core populations of gnatcatchers and maintaining connectivity between these populations. As described above, the permanent loss of 422.1 acres of gnatcatcher habitat and loss of 3 gnatcatcher pairs, though not insignificant, is a relatively small impact in consideration of the thousands of acres of coastal sage and gnatcatcher territories (roughly 2,562 pairs) rangewide. Furthermore, implementation of the mitigation plan in advance of project impacts will ensure that substantial areas of occupied habitat are maintained adjacent to the impact area, and the restoration of temporary impact areas immediately following construction will help maintain and support local gnatcatcher populations in the project area.

The project will result in permanent impacts up to 422.1 acres and temporary impacts up to 16.4 acres of gnatcatcher habitat and result in noise disturbance, displacement, and reproductive loss of up to 3 gnatcatcher pairs; however, conservation measures have been incorporated into the project to minimize these impacts. In addition, the project will provide 677 acres of gnatcatcher mitigation in the vicinity of the project, with a minimum of 503.3 acres of offsite mitigation secured in advance of project impacts. This advanced mitigation will be focused in the northeastern portion of the gnatcatcher's range, and at least half of the offsite mitigation will conserve or restore occupied gnatcatcher habitat. With the proposed conservation, restoration, and management, we anticipate that the project will have a net neutral or positive effect on the gnatcatcher population rangewide and will substantially address threats to recovery in this portion of its range, and for this reason the project is not expected to negatively affect gnatcatcher recovery.

<u>Least Bell's Vireo</u>

The project will permanently affect 6 acres of modeled vireo recolonization breeding habitat (this includes 2.7 acres of permanent noise impacts). Temporary impacts will occur to 3.0 acres of modeled vireo breeding habitat (Table 1). Vireo modeled habitat is distributed throughout the

project area as shown in Figure 8. Surveys have documented a vireo (representing a vireo territory) at Una Lake, a singing male (representing a vireo territory) in the Santa Clara River, and up to 4 vireo territories in Pacoima Wash. In addition, unsurveyed modeled habitat is mapped in the vicinity of Agua Dulce, about 2.5 miles north of the Santa Clara River. While much of the habitat at Una Lake and the Santa Clara River will be avoided by the project, vireos at these locations may be subject to increased disturbance from construction and operational noise and lighting. The vireos at Pacoima Wash are located east of a tunneled section of the project alignment and about 2,500 feet southwest of a project staging area; project staging is located within the wash, but with the proposed conservation measures, we do not anticipate negative impacts to vireo habitat from increased sediment and pollution. We anticipate that vegetation removal for the project will result in direct impacts to one known vireo territory at Una Lake, and one known vireo territory at the Santa Clara River will be permanently affected by operational noise from the project. Additional vireo territories may occur within unsurveyed modeled habitat.

The project has incorporated conservation measures to avoid and minimize impacts to vireos. In areas occupied by vireos, active nests will be avoided with a 500-foot no-work buffer (CM-Avian-01, CM-Avian-02). Vegetation removal for the project within occupied vireo habitat will be conducted under the supervision of the Designated Biologist either between September 1 and March 14, when vireos have migrated to their winter range and will not be present in the project area, or after vireos have left the area (CM-GEN-01, CM-GEN-02, CM-Avian-01, CM-Avian-02). In addition, all native or sensitive habitats outside and adjacent to the construction limits will be designated as ESAs on project maps. ESAs will be temporarily fenced during construction with orange plastic snow fence, orange silt fencing, or in areas of flowing water, with stakes and flagging (CM-GEN-15). Therefore, we do not expect that vireo adults, eggs, or nestlings will be directly killed or injured. However, vireo pairs usually return to the same breeding territory each year (Rourke and Kus 2007), and the removal of a substantial portion of a vireo pair's territory will force the pair to expand their existing territory or establish a new territory. Displaced vireos may be forced to compete with resident vireos when attempting to expand an existing territory or establish a new territory.

If displaced birds cannot find suitable habitat to forage and shelter in, we anticipate they will be more vulnerable to predation and otherwise may die or be injured. Vireos that successfully establish territories in adjacent habitat are expected to experience reduced productivity (e.g., delayed initiation or prevention of nest building, fewer nesting attempts per season, and/or overall reduction in reproductive output) due to reduced availability of foraging and breeding habitat and increased territorial interactions. For example, surveys conducted during the 2004 and 2005 breeding seasons on San Diego Creek in Orange County found that when vireo breeding habitat was removed, vireos returning to the affected area had lower productivity than vireos occupying a portion of the creek where the vegetation was unaltered. Four territories where habitat was removed produced a total of five young (1.25 young/pair). Two other territories, which did not have habitat removed, produced a total of eight young (4 young/pair; Chambers Group, Inc. 2005).

Upon returning from their winter range, if the vireo pairs can successfully establish new territories, they could experience increased territorial interactions and be harmed by the overall reduced availability of foraging habitat in the project area. In addition, we anticipate that the vireos will be subject to disturbance from construction activities.

Within the 2.7-acre area of permanent noise impacts, operational noise could result in displacement and reproductive loss for the vireo pairs. Displaced vireos may also be subjected to increased predation, death, or injury and may not be able to find sufficient nearby habitat or may be forced to compete with other vireos when attempting to expand an existing territory or establish a new territory. Occupancy and reproductive productivity are anticipated to decline within the noise effect zone.

The project will provide a minimum of 21 acres of mitigation for vireos, consisting of conservation and/or restoration of vireo habitat. A mitigation plan will be prepared and provided to the CFWO for review and approval prior to initiation of vegetation removal for the project (CM-Mit-01). Once the plan has been approved by the CFWO, any proposed conservation will be secured, and any off-site restoration work will commence in advance of project impacts. Because the acreage of conservation relative to restoration of vireo habitat is not known, it is difficult to anticipate the net effect of the project on the vireo population rangewide. However, even if the offsite mitigation is limited to conservation and long-term management, the enhancement of existing habitat (e.g., through removal of non-native species) is likely to increase the value of the conserved habitat such that the net effect of the project on the vireo population rangewide is likely to be neutral. If the offsite mitigation includes significant habitat restoration in addition to conservation and long-term management, the project is likely to have a net positive effect on the vireo population rangewide.

At each location where impacts to vireo habitat will occur, the project will impact a fraction of the available habitat, and much larger areas of intact habitat will remain outside the project footprint. Therefore, vireo are anticipated to remain in the vicinity of both Una Lake and along the Santa Clara River, and if vireos do occur in Agua Dulce, they are anticipated to remain in that drainage as well. In addition to directly impacting habitat, the project will increase habitat fragmentation at each of the three locations with modeled habitat. However, dispersing vireo will still be able to move across over the rail lines or under the bridges along the Santa Clara River and Agua Dulce, so habitat fragmentation is not anticipated to limit vireos' ability to access suitable habitat at any of the impacted locations.

In summary, implementation of the proposed project will result in permanent impacts to 6 acres of modeled vireo habitat and is likely to result in a short-term reduction in the number of vireos supported in the action area (including 2 known pairs) due to the direct loss of a portion of their habitat. If they survive the initial habitat loss, they may be subject to breeding season disturbance that could lead to displacement, reproductive loss, increased predation, death, or injury. The vireo pairs to be impacted represent less than 0.1 percent of the rangewide estimate of vireo pairs (approximately 2,884 pairs). During construction, we expect vireos will continue to occupy habitat adjacent to the project area, and construction disturbance in the project area will be temporary. With implementation of offsetting mitigation, the project is not anticipated to reduce

the number of vireos that can be supported in the general project area or increase the local risk of vireo extirpation. Thus, the project is not expected to result in an appreciable reduction in the numbers, reproduction, or distribution of the species rangewide.

Habitat Restoration

The mitigation plan for the project will include restoration of temporary impacts to 3.0 acres of riparian habitat suitable for vireo breeding. It may be 2 to 7 years until restored riparian habitats are again suitable for vireo nesting. Because occupied vireo habitat is present adjacent to the action area, we anticipate that vireo pairs will remain in the surrounding area. Thus, we expect the temporarily impacted habitat will be re-occupied as soon as it is mature enough to support vireo breeding.

Habitat restoration planting and maintenance is expected to benefit vireos, but it may also result in disturbance of vireos that are adjacent to the restoration site, or that move into the site as restoration progresses. However, the project includes conservation measures to minimize disturbance of vireos during restoration work and to ensure that no nests are destroyed as a result of maintenance activities (CM-Rest-01).

Effect on Recovery

The project is consistent with the recovery goals identified in the draft recovery plan for vireo (Service 1998). The restoration work will help accomplish recovery task 1, which is to protect and manage riparian and adjacent upland habitat within the vireo's historic range; and recovery task 3, which is to develop and evaluate vireo habitat restoration projects and techniques.

The project will result in permanent impacts up to 6 acres and temporary impacts up to 3.0 acres of vireo breeding and foraging habitat and result in noise disturbance, displacement, and reproductive loss of 2 known vireo pairs; however, conservation measures have been incorporated into the project to minimize these impacts. In addition, the project will provide 21 acres of vireo mitigation in the vicinity of the project, with offsite mitigation secured in advance of project impacts. Thus, we anticipate that the project will have a net neutral or positive effect on the number of vireo supported rangewide, and for this reason the project is not expected to negatively affect vireo recovery.

Southwestern Willow Flycatcher

Southwestern willow flycatchers are not known to occur in the action area. However, flycatcher surveys were not conducted for the project because the Authority was unable to obtain permission to enter all properties within the action area and, therefore, could not conduct habitat assessments and biological surveys within much of the action area. There is a record for a flycatcher in the Santa Clara River 2.9 miles east of the project alignment, and suitable habitat is modeled adjacent to the project alignment in this area. There is also a record for flycatchers at Hansen Flood Control Basin; However, it is approximately 1.25 miles away from the project alignment, and there is no suitable habitat within this portion of the project area. In

addition, unsurveyed modeled habitat is mapped in the vicinity of Una Lake, Agua Dulce, and Pacoima Wash.

The project will permanently affect 6 acres of modeled flycatcher breeding habitat (this includes 2.7 acres of permanent noise impacts). Temporary impacts will occur to 3.0 acres of modeled flycatcher breeding habitat (Table 1). Flycatcher modeled habitat is distributed throughout the project area as shown in Figure 9. This modeled habitat is classified in the "Other" category, as suitable riparian habitat not mapped in the top three classes (Very high, high, and moderate) of the Hatten model developed by USGS (Hatten 2016). The number of flycatcher territories impacted by the project is likely to be low considering that there are no records for flycatchers from within the action area; modeled habitat is within the "other" category; and project impacts to a total of 11.7 acres of modeled habitat will occur in small patches along the 38-mile length of the project. Thus, based on our best professional judgement, up to 1 flycatcher territory may be affected.

The project has incorporated conservation measures to avoid and minimize impacts to flycatchers. In areas occupied by flycatchers, active nests will be avoided with a 500-foot no-work buffer (CM-Avian-01, CM-Avian-02). Vegetation removal for the project within occupied flycatcher habitat will be conducted under the supervision of the Designated Biologist between September 15 and April 30, when flycatchers have migrated to their winter range and will not be present in the project area, or after flycatchers have left the area (CM-GEN-01, CM-GEN-02, CM-Avian-01, CM-Avian-02). In addition, all native or sensitive habitats outside and adjacent to the construction limits will be designated as ESAs on project maps. ESAs will be temporarily fenced during construction with orange plastic snow fence, orange silt fencing, or in areas of flowing water, with stakes and flagging (CM-GEN-15). Therefore, we do not expect that flycatcher adults, eggs, or nestlings will be directly killed or injured.

Upon returning from their winter range, flycatchers could experience increased territorial interactions and be harmed by the overall reduced availability of foraging habitat in the project area. In addition, we anticipate that the flycatchers will be subject to disturbance from construction activities.

Within the 2.7-acre area of permanent noise impacts, operational noise could result in displacement and reproductive loss for flycatchers. Displaced flycatchers may also be subjected to increased predation, death, or injury and may not be able to find sufficient nearby habitat or may be forced to compete with other flycatchers when attempting to expand an existing territory or establish a new territory.

The project will provide a minimum of 15 acres of mitigation for flycatchers, consisting of conservation and/or restoration of flycatcher habitat. A mitigation plan will be prepared and provided to the CFWO for review and approval prior to initiation of vegetation removal for the project (CM-Mit-01). Once the plan has been approved by the CFWO, any proposed conservation will be secured, and any off-site restoration work will commence, in advance of project impacts. Because the acreage of conservation relative to restoration of flycatcher habitat is not known, it is difficult to anticipate the net effect of the project on the flycatcher population

rangewide. However, even if the offsite mitigation is limited to conservation and long-term management, the enhancement of existing habitat (e.g., through removal of non-native species) is likely to increase the value of the conserved habitat such that the net effect of the project on the flycatcher population rangewide is likely to be neutral.

At each location where impacts to flycatcher habitat will occur, the project will impact a fraction of the available habitat, and much larger areas of intact habitat will remain outside the project footprint. Therefore, flycatchers are anticipated to remain in suitable habitat in the vicinity of any location where they are displaced. In addition to directly impacting habitat, the project will increase habitat fragmentation at each of the locations with modeled habitat. However, dispersing flycatchers will still be able to move across over the rail lines or under the bridges along the Santa Clara River and Agua Dulce, so habitat fragmentation is not anticipated to limit flycatchers' ability to access suitable habitat at any of the impacted locations.

In summary, implementation of the proposed project will result in permanent impacts to 6 acres of modeled flycatcher habitat and may result in a short-term reduction in the number of flycatchers supported in the action area due to the direct loss of a portion of their habitat (up to 1 pair). If they survive the initial habitat loss, they may be subject to breeding season disturbance that could lead to displacement, reproductive loss, increased predation, death, or injury. However, with implementation of project measures, impacts to flycatcher will occur over a small portion of the suitable habitat available in the project area, and direct mortality will be avoided. During construction, we expect flycatchers will continue to occupy habitat adjacent to the project area, and construction disturbance in the project area will be temporary. With implementation of offsetting mitigation, the project is not anticipated to reduce the number of flycatchers that can be supported in the general project area or increase the local risk of flycatcher extirpation. Thus, the project is not expected to result in an appreciable reduction in the numbers, reproduction, or distribution of the species rangewide.

Habitat Restoration

The mitigation plan for the project will include restoration of temporary impacts to 3.0 acres of riparian habitat suitable for flycatcher breeding. It may be 5 years until restored riparian habitats are again suitable for flycatcher nesting (Service 2013).

Habitat restoration planting and maintenance is expected to benefit flycatchers, but it may also result in disturbance of flycatchers that are adjacent to the restoration site, or that move into the site as restoration progresses. However, the project includes conservation measures to minimize disturbance of flycatchers during restoration work and to ensure that no nests are destroyed as a result of maintenance activities (CM-Rest-01).

Effect on Recovery

According to the recovery plan for the southwestern willow flycatcher, the Santa Clara River is part of the Santa Clara Management Unit, which is in the Coastal California Recovery Unit (Service 2002). Within this Management Unit, the recovery plan defines a series of reaches where recovery actions should be focused, and these reaches are outside of the action area. One

reach is within the Santa Clara River west of the action area, from Bouquet Canyon Road to the Pacific Ocean, and another reach is east of the action area in Soledad Canyon, from Soledad Campground to Agua Dulce.

Mitigation for project impacts will help accomplish recovery task 1, which is to increase and improve currently suitable and potentially suitable habitat. The project will result in permanent impacts up to 6 acres and temporary impacts up to 3.0 acres of flycatcher breeding and foraging habitat and may result in noise disturbance, displacement, and reproductive loss of flycatcher pairs; however, conservation measures have been incorporated into the project to minimize these impacts. In addition, the project will provide 15 acres of flycatcher mitigation in the vicinity of the action area, with offsite mitigation secured in advance of project impacts. Thus, we anticipate that the project will have a net neutral or positive effect on the number of flycatcher territories supported rangewide, and for this reason the project is not expected to negatively affect flycatcher recovery.

Arroyo toad and its Designated Critical Habitat

Though project surveys for arroyo toad have not been conducted, the action area is adjacent and connected to upstream habitat where arroyo toads have been documented. Arroyo toads may occur within the project footprint in the vicinity of the Santa Clara River, especially in wet years when arroyo toads are more likely to disperse further from occupied breeding habitat. The project will permanently impact 40 acres of modeled arroyo toad upland / aestivation habitat and 5 acres of modeled arroyo toad wetland / breeding habitat and will temporarily impact 22 acres of modeled arroyo toad upland / aestivation habitat. The project will also permanently and temporarily impact 16.5 and 12.5 acres of modeled arroyo toad permeable movement area, respectively.

Quantifying the number of arroyo toads within the project footprint is difficult. The exact distribution and population size fluctuate due to the dynamic conditions associated with arroyo toad habitat. Suitable habitat may change from year to year depending on climatic conditions, flooding, or other natural or human-related events (Service 1999), which in turn influence reproductive success and juvenile survival. Therefore, it is anticipated that the arroyo toad population subject to impacts from the project will experience population fluctuations, making it difficult to determine the precise number of arroyo toads that could be adversely affected at any given time.

In addition, except during the early juvenile stage (first 4–5 weeks), arroyo toads forage at night and burrow during the day. Nocturnal activity is usually associated with rainfall and moderate temperatures and some nights of very high relative humidity (Service 1999). Juveniles and adult toads may range up to 1.2 miles from the watercourse into the surrounding uplands (Service 1999). Therefore, detection of arroyo toads outside of the breeding season is very difficult, with limited ability for anticipating when the species may be active. Lastly, no reliable survey method exists for determining the locations or densities of arroyo toads that may be burrowed within upland habitat.

Due to these constraints, the precise number of arroyo toads that may be located within the project area is not known. As discussed in the *Environmental Baseline* section, protocol arroyo toad surveys have not been conducted within the project area, but arroyo toads have been detected upstream of the action area in adjacent and connected habitat within the Santa Clara River. Therefore, it is possible that the project footprint may support aestivating, dispersing, and/or foraging juvenile and adult arroyo toads.

There is a single record from CNDDB for arroyo toads from 2001 reporting 2 larvae and 1 metamorph approximately 0.75 mile upstream from the project footprint in the Santa Clara River. The project will impact a total of 96 acres of modeled habitat for the arroyo toad. In addition, the project has incorporated measures to avoid working in the wetted areas of the Santa Clara River (CM-UTS-02, CM-UTS-03)). Because of the low numbers of arroyo toads reported in the vicinity of the action area and the measures that will be implemented to avoid impacts to the wetted areas of the Santa Clara River, we estimate that up to 10 arroyo toads could be present within the work area (about 1 toad per 10 acres of modeled habitat). This estimate of arroyo toad density is much lower than is typical for projects in the immediate vicinity of an active breeding site and assumes that only dispersing arroyo toads from the nearest documented breeding site (0.75 mile from the project footprint) are likely to occur in the project footprint.

The project has incorporated measures to avoid and minimize impacts to arroyo toads. These include preconstruction surveys (CM-ARTO-01), monitoring and translocation, including installation of exclusionary fencing, surveys, and translocation of arroyo toads out of the impact area (CM-ARTO-02), and avoidance measures for arroyo toad, including daily clearance surveys, limiting work during rainfall events, and implementing limitations on hazardous materials, herbicides, and pesticides (CM-ARTO-03) (see Appendix 3 for detailed measures).

Up to seven individual arroyo toads may be captured and relocated out of the project footprint. We estimate that up to three individuals (about a quarter of those present in the project footprint) will go undetected and will be killed or injured (i.e., crushed) during earth-disturbing activities and grading. However, because arroyo toads in the project footprint are likely to be burrowed underground, it will make it difficult to observe and document death or injury from construction activities. Therefore, we anticipate that no more than one individual will be observed killed or injured as a result of construction-related activity.

There is also the potential for arroyo toads to be killed, injured, or stressed during capture and relocation efforts. However, trapping and relocation efforts will be conducted by individuals familiar with arroyo toad biology and ecology, who will follow the Declining Amphibian Population Task Force's Fieldwork Code of Practice (DAPTF 1998) to avoid transferring disease or pathogens between aquatic habitats during surveys and handling of arroyo toads (CM-ARTO-02). Therefore, we anticipate that very few arroyo toads (no more than one) will be killed or injured during capture and relocation efforts. Because a large amount of suitable arroyo toad aestivation, dispersal, and foraging habitat will remain near the action area after project construction, the translocation of arroyo toads within the impact area to adjacent suitable habitat is not anticipated to result in adverse impacts associated with intraspecific competition.

The project will provide a minimum of 124.5 acres of mitigation for arroyo toads, consisting of conservation and/or restoration of arroyo toad habitat. A mitigation plan will be prepared and provided to the CFWO for review and approval prior to initiation of vegetation removal for the project (CM-Mit-01). Once the plan has been approved by the CFWO, any proposed conservation will be secured, and any off-site restoration work will commence, in advance of project impacts. Because the acreage of conservation relative to restoration of arroyo toad habitat is not known, it is difficult to anticipate the net effect of the project on the arroyo toad population rangewide. However, even if the offsite mitigation is limited to conservation and long-term management, the enhancement of existing habitat (e.g., through removal of non-native plant species) is likely to increase the value of the conserved habitat such that the net effect of the project on the arroyo toad population rangewide is likely to be neutral.

The project will impact a fraction of the available habitat along the Santa Clara River, and much larger areas of intact habitat will remain outside the project footprint. Therefore, arroyo toads are anticipated to remain in suitable habitat in the vicinity of any location where they are displaced. In addition to directly impacting habitat, the project will increase habitat fragmentation along the Santa Clara River. In particular, arroyo toads will not be able to disperse over the above-ground portions of the track on either side of the Santa Clara River. However, the river widens considerably where the bridge is proposed, and the bridge will span the entire width of the river, so arroyo toads will still be able to disperse under the bridge to access habitat upstream and downstream of the track. In addition, the long span will minimize potential effects to the hydrological processes necessary for maintaining arroyo toad habitat such that arroyo toad habitat is anticipated to remain upstream and downstream of the proposed project.

Based on the limited extent of the project footprint and the implementation of conservation measures, the number of individuals impacted by the project will be low and is not likely to result in an appreciable reduction in the reproduction, numbers, or distribution of the arroyo toad population in the project vicinity or the species as a whole. In addition, temporarily impacted habitat will be restored upon project completion, and because arroyo toads are not dependent on mature vegetation, we expect temporarily impacted areas to be re-occupied shortly following project completion.

Critical Habitat

The project will permanently impact 2.4 acres of designated critical habitat for the arroyo toad, all of which contain PBFs for the species. The area of critical habitat that will be impacted is located within Subunit 6c, which includes 1,279 acres of designated critical habitat. The permanent impacts of the project on Subunit 6c of designated critical habitat for the arroyo toad represent less than 0.2 percent of the designated critical habitat within the subunit, and an even smaller percentage of the critical habitat designated for this species.

According to the final rule designating critical habitat (Service 2011), This subunit is important for maintaining the arroyo toad metapopulation in the upper Santa Clara River Basin. Additionally, the upper portion of the Santa Clara River in this subunit supports a breeding population of arroyo toads that has the potential to greatly increase in size. Subunit 6c contains

the physical and biological features that are essential to the conservation of the species, including breeding pools in low gradient stream segments with sandy substrates, seasonal flood flows and riparian habitat and upland benches for foraging and dispersal. The physical and biological features essential to the conservation of the species in this subunit may require special management considerations or protection to address threats from urban development, agriculture, recreation, mining, and nonnative predators.

As described above, although the project will increase habitat fragmentation along the Santa Clara River, the track would cross near the western edge of Subunit 6c, limiting the amount of fragmentation. In addition, arroyo toads will still be able to disperse under the bridge spanning the river, and the length of the bridge will minimize the effects to hydrological processes such that PBFs are anticipated to be maintained within Subunit 6c upstream and downstream of the proposed project.

The project will result in the permanent loss of 2.4 acres of arroyo toad critical habitat. The project will provide a minimum of 124.5 acres of mitigation for arroyo toads that includes conservation and/or management of arroyo toad habitat, and this mitigation will include a minimum of 4.8 acres of arroyo toad critical habitat. This will help maintain the long-term function of arroyo toad critical habitat in the project area and the ability of this critical habitat subunit to maintain the arroyo toad metapopulation in the upper Santa Clara River Basin.

Habitat Restoration

The project will restore 22.0 acres of native upland habitats suitable for aestivation, dispersal, and foraging, and 12.5 acres of permeable movement area for arroyo toad on the project site. There is the possibility that arroyo toads could be killed or injured during restoration activities, such as planting container plants and weeding. The project has incorporated measures to minimize impacts to arroyo toads from restoration activities (CM-Rest-01). If maintenance of restoration areas is necessary within or directly adjacent to suitable arroyo toad breeding habitat during the March 1 to August 15 arroyo toad active season while water is flowing or has ponded in the area, the Project Biologist will monitor potential arroyo toad breeding habitat to determine whether egg clutches, larvae, or juveniles are present. If eggs, larvae, or juvenile arroyo toads are found, restoration maintenance work will not occur in the area until signs of breeding are no longer evident. Restoration maintenance work will be avoided during rain events to limit sedimentation into breeding habitat. Restoration activities will be conducted on foot, or with lightweight all-terrain vehicles and/or small gators with trailers, with soft tires with minimal tread and a wide wheel base and low vehicle speeds, to better distribute weight and reduce soil disturbance. In addition, either arroyo toad exclusion fencing will be maintained around restoration areas for the duration of restoration maintenance work or earth disturbing activities conducted for restoration work (e.g., irrigation repairs, replanting) where there is potential for presence of aestivating arroyo toads (i.e., sandy, friable soils) will be monitored by the Project Biologist to ensure that impacts to arroyo toads are avoided to the greatest extent feasible.

As described above, it is difficult to predict the number of arroyo toads that may occur within the temporary impact areas. Based on the estimated density of arroyo toads in the vicinity of the

proposed project, we anticipate that no more than three juvenile or adult arroyo toads (i.e., greater than 1 inch snout-vent-length) will be killed or injured by restoration activities, and no more than one juvenile or adult arroyo toad will be observed dead or injured as a result of the habitat restoration. The long-term benefit of the habitat restoration activities will substantially outweigh the potential death or injury of a small number of arroyo toads from these activities.

Effect on Recovery

The project is consistent with the recovery goals identified in the recovery plan for the arroyo toad (Service 1999). Mitigation for project impacts will help accomplish recovery task 1, which is to secure existing populations by protecting, maintaining, restoring, and enhancing breeding and upland habitats.

The project will result in permanent impacts up to 61.5 acres and temporary impacts up to 34.5 acres of arroyo toad breeding, aestivation, and dispersal habitat, and may result in the loss of a small number of arroyo toads; however, conservation measures have been incorporated into the project to minimize these impacts. Arroyo toads will be translocated out of the project footprint to minimize direct impacts, and temporary impacts to arroyo toad habitat will be restored following construction. In addition, the project will provide 124.5 acres of arroyo toad mitigation in the vicinity of the action area, with offsite mitigation secured in advance of project impacts. Thus, we anticipate that the project-related impacts will be fully mitigated, and the project is not expected to negatively affect arroyo toad recovery.

Slender-Horned Spineflower

There is a population of slender-horned spineflower within 20 feet of the project footprint in Bee Canyon, and unsurveyed modeled habitat for the species is present in Pacoima Wash. Because the slender-horned spineflower occurrence at Bee Canyon is one of three extant or presumed extant occurrences in Los Angeles County and is the only one that has been surveyed and documented within the past 15 years, maintenance of this population is important for maintaining the species' distribution. The project will permanently affect 29.6 acres of modeled core suitable habitat and 312.6 acres of modeled potentially suitable habitat for the species. In addition, the project will temporarily affect 21.7 acres of modeled core suitable habitat and 4.8 acres of modeled potentially suitable habitat. Slender-horned spineflower modeled habitat is distributed throughout the project area as shown in Figure 10.

The project has incorporated measures to avoid and minimize impacts to slender-horned spineflower individuals. Surveys will be conducted prior to any vegetation removal or ground disturbing activities for the project (CM-PLT-01). If slender-horned spineflower are present in the project footprint and can't be avoided, the Authority will reinitiate section 7 consultation to address unanticipated impacts to the species.

The project will result in impacts to overland flows in occupied spineflower habitat in Bee Canyon Wash. Project construction will result in a broad hill cut to the east of the wash, and the placement of permanent "stormwater conveyance culverts" under the alignment that will convey water from the tributaries east of the alignment under the alignment to Bee Canyon Wash.

During section 7 consultation, the project was redesigned to relocate a detention basin at the northern portion of Bee Canyon Wash to within the permanent footprint to minimize direct impacts and impacts from overland flows to occupied slender-horned spineflower habitat. The detention basin is designed to contain construction water pumped out of the tunnel during construction and would be a permanent feature that would be used to contain water pumped out of the tunnel following storm events.

The proposed project is anticipated to adversely affect some portion of the extant population through changes to hydrology and sedimentation. Any modification of hydrology and sediment flow in the tributaries that feed into Bee Canyon is likely to alter the frequency or intensity of overland flows that maintains the current distribution of habitat and, therefore, to adversely affect some individuals in the population. Because project design is in early stages, insufficient information is available to quantify the impact to overland flows in Bee Canyon. Therefore, measures have been incorporated into the project to ensure that periodic large-scale flooding that allows alluvial fan sage scrub habitat to remain in a successional state will be maintained such that the habitat in Bee Canyon remains suitable for the species. These include CM-PLT-02: Maintenance of Existing Hydrologic Conditions to Maintain Slender-horned Spineflower Habitat Below the Preferred Alternative Alignment in Bee Canyon, HYD-IAMF#1 Storm Water Management, HYD-IAMF#2 Flood Protection, and HYD-IAMF#3 Prepare and Implement a Construction Stormwater Pollution Prevention Plan. These measures are intended to minimize alterations to watercourses and maintain existing stormwater patterns within spineflower habitat. The Authority will provide the SWPPP and Stormwater Management and Treatment Plan for review by the Service at the 60 percent design stage to ensure that the hydrological processes necessary for slender-horned spineflower are maintained.

In Pacoima Wash, large-scale flooding has already been affected by Pacoima Reservoir upstream, and residential construction to the east and west (Figure 10). In addition, project impacts to the habitat within Pacoima Wash are largely temporary and will be restored once project construction has been completed. Measures have been incorporated into the project to minimize alterations to watercourses and maintain existing stormwater patterns within spineflower habitat (CM-PLT-02, HYD-IAMF#1, HYD-IAMF#2, HYD-IAMF#3). The project has also been redesigned during section 7 consultation to minimize impacts to Limekiln Canyon Creek, which feeds into Pacoima Wash near the project footprint. Thus, we do not anticipate significant long-term impacts to flood flows within Pacoima Wash from the project.

In addition, the project will provide a minimum of 168 acres of mitigation for spineflower. A mitigation plan will be prepared and provided to the CFWO for review and approval prior to initiation of vegetation removal for the project (CM-Mit-01). Once the plan has been approved by the CFWO, any proposed conservation will be secured, and any off-site restoration work will commence, in advance of project impacts.

Surveys will be conducted prior to any vegetation removal or ground disturbing activities for the project to ensure that slender-horned spineflower are not directly impacted by construction activity. In addition, measures have been incorporated into the project to ensure that periodic large-scale flooding that allows alluvial fan sage scrub habitat to remain in a successional state

will be maintained such that the habitat in the project area remains suitable for the species. With implementation of offsetting mitigation, the project is not anticipated to result in an appreciable reduction in the numbers, reproduction, or distribution of the species rangewide.

Habitat Restoration

The mitigation plan for the project will include restoration of temporary impacts to 26.5 acres of alluvial fan habitat suitable for slender-horned spineflower. This annual species inhabits openings in intermediate and mature alluvial fan sage scrub, where disturbance from flooding is less frequent (i.e., every 50 to 100 years). Where occupied slender-horned spineflower habitat is present adjacent to the action area and periodic large-scale flooding persists, we anticipate that spineflower will be able to colonize temporarily impacted habitats when flood conditions allow for seed dispersal.

Habitat restoration planting and maintenance is expected to benefit to the spineflower, but it may result in disturbance of spineflowers that are present within the seed bank or colonize the site as restoration progresses. However, the project includes conservation measures to minimize impacts to spineflowers from restoration work and to ensure that no spineflowers are harmed as a result of maintenance activities (CM-Rest-01).

Effect on Recovery

There is no recovery plan for slender-horned spineflower, but the project is consistent with the general recovery goals of maintaining core populations of spineflowers and the hydrologic processes upon which they depend. As described above, the project will result in impacts to slender-horned spineflower and its habitat, but the Authority will provide the SWPP and Stormwater Management and Treatment Plan for review by the Service at the 60 percent design stage to ensure that the hydrological processes necessary to support slender-horned spineflower habitat are maintained. Further, if slender-horned spineflower are found within the project footprint, the Authority will reinitiate section 7 consultation to address unanticipated impacts to the species. Finally, because substantial areas of occupied habitat will remain adjacent to the impact area, and habitat restoration will be initiated following construction, little risk exists that the project will extirpate any slender-horned spineflower populations in the project area.

The Authority will offset the permanent loss of modeled spineflower habitat through the conservation of 168 acres of spineflower habitat in the vicinity of the action area, with offsite mitigation secured in advance of project impacts, which will contribute to the conservation and recovery of the species.

CUMULATIVE EFFECTS

Cumulative effects are effects of future State or private activities, not involving Federal activities, that are reasonably certain to occur within the action area of the Federal action subject to consultation (50 CFR § 402.02). Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act. We are unaware of any future non-Federal actions that are reasonably

certain to occur within the action area and may affect the gnatcatcher, vireo, flycatcher, arroyo toad, and slender-horned spineflower.

CONCLUSION

After reviewing the current status of the gnatcatcher, vireo, flycatcher, arroyo toad, and slender-horned spineflower, the environmental baseline for the action area, effects of the proposed action, and the cumulative effects, we have determined that the activities considered in this biological opinion are not likely to jeopardize the continued existence of the gnatcatcher, vireo, flycatcher, arroyo toad, and slender-horned spineflower, or adversely modify designated critical habitat for the arroyo toad. We have reached this conclusion for the following reasons:

- Adverse effects to all federally listed species and designated critical habitat will be reduced by implementation of the avoidance and minimization measures identified in the "Project Description" (see Appendix 3) of this biological opinion.

- The restoration of temporary impact areas with native species will help minimize and offset project impacts by restoring habitat for listed species to breed, forage, shelter, and disperse.

- Wildlife connectivity measures proposed in association with the project will ensure that ecosystem functions are maintained for the benefit of listed species.

- With the proposed conservation measures, project-related impacts to federally listed species will be fully offset, and we consider the project and associated conservation and restoration to be consistent with the recovery goals of the species.

Coastal California Gnatcatcher

- The proposed project will result in a short-term reduction (up to 2 pairs and one unpaired female) in the number of gnatcatchers supported in the action area due to the direct loss of a portion of their habitat and/or construction and noise disturbance, which represents less than 0.2 percent of the roughly 2,562 pairs rangewide.

- The project will permanently impact 438.6 acres of modeled gnatcatcher habitat out of thousands of acres of gnatcatcher habitat rangewide.

- The project will temporarily affect 16.4 acres of modeled gnatcatcher habitat; this habitat will be restored and will again be suitable habitat for gnatcatcher breeding and foraging within 4 to 5 years.

- Impacts to modeled gnatcatcher habitat will be offset in advance of project impacts and within the northeastern extent of the species range, as detailed in the Conservation Measures.

Least Bell's vireo

- The proposed project will result in a short-term reduction (up to 2 pairs) in the number of vireos supported in the action area due to the direct loss of a portion of their habitat and/or construction and noise disturbance, which represents less than 0.1 percent of the roughly 2,968 pairs rangewide.

- The project will permanently impact 8.7 acres of modeled vireo habitat out of thousands of acres of vireo habitat rangewide.

- The project will temporarily affect 3.0 acres of vireo occupied habitat; this habitat will be restored and will again be suitable habitat for vireo breeding and foraging within 2 to 7 years.

- Impacts to modeled vireo habitat will be offset as detailed in Table 1 and the Conservation Measures.

Southwestern willow flycatcher

- The proposed project will result in a short-term reduction (up to 1 pair) in the number of flycatchers supported in the action area due to the direct loss of a portion of their habitat and/or construction and noise disturbance, which represents less than 0.1 percent of the roughly 1,299 pairs rangewide.

- The project will permanently impact 8.7 acres of modeled flycatcher habitat out of thousands of acres of flycatcher habitat rangewide.

- The project will temporarily affect 3.0 acres of modeled flycatcher habitat; this habitat will be restored and will again be suitable habitat for flycatcher breeding and foraging within 5 years.

- Impacts to modeled flycatcher habitat will be offset as detailed in Table 1 and the Conservation Measures.

Arroyo toad and its designated critical habitat

- Injury and death of aestivating arroyo toads will be minimized by installing exclusionary fencing around areas of suitable arroyo toad habitat within the project impact area, surveying for arroyo toads within fenced areas, and relocating any arroyo toads found within the fenced areas to suitable habitat outside of the project impact area.

- The project will permanently impact up to 40 acres of modeled arroyo toad upland/ aestivation habitat, 5 acres of modeled arroyo toad wetland/ breeding habitat, and 16.5 acres of modeled arroyo toad permeable movement area out of thousands of acres of arroyo toad habitat rangewide.

- The project will temporarily affect 22 acres of modeled arroyo toad upland/ aestivation habitat and 12.5 acres of modeled arroyo toad permeable movement area; this habitat will be restored and because arroyo toads are not dependent on mature vegetation, we expect temporarily impacted areas to be re-occupied shortly following project completion.

- The project will permanently impact 2.4 acres of arroyo toad designated critical habitat out of the 1,279 acres of designated critical habitat within Subunit 6c of designated critical habitat, which represents less than 0.2 percent of the Subunit and an even smaller percentage of designated arroyo toad critical habitat.

- Impacts to modeled arroyo toad habitat will be offset as detailed in Table 1 and the Conservation Measures.

- The capture and translocation, death, or injury of the arroyo toads in the project footprint and the impacts to 96 acres of arroyo toad habitat within the project area are not expected to appreciably reduce the numbers, reproduction, or distribution of the arroyo toad in the action area or throughout the species' range.

Slender-horned spineflower

- Destruction of slender-horned spineflower individuals will be minimized by surveys, and the Authority will reinitiate section 7 consultation if slender-horned spineflowers are found within the project footprint and can't be avoided.

- The project will permanently impact 342.2 acres of modeled slender-horned spineflower habitat out of thousands of acres of spineflower habitat rangewide.

- The project will temporarily affect 26.5 acres of modeled slender-horned spineflower habitat; this habitat will be restored, and we anticipate that spineflower will be able to colonize these restored areas when flood conditions allow for seed dispersal.

- Impacts to modeled spineflower habitat will be offset as detailed in Table 1 and the Conservation Measures.

INCIDENTAL TAKE STATEMENT

Section 9 of the Act and Federal regulation pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without special exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or attempt to engage in any such conduct. The Service further defines "harm" to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavior patterns, including breeding, feeding, or sheltering. Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not the purpose of the agency action is not considered to be prohibited taking under the Act provided

that such taking is in compliance with the proposed protective measures and the terms and conditions of an incidental take statement and occurs as a result of the action as proposed.

The measures described below are non-discretionary and must be undertaken by the Authority for the exemption in section 7(o)(2) to apply. The Authority has the continuing duty to regulate the activity that is covered by this incidental take statement. If the Authority fails to assume and implement the terms and conditions, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Authority must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR § 402.14(i)(3)].

AMOUNT OR EXTENT OF TAKE

Coastal California Gnatcatcher

We anticipate that up to 3 pairs of gnatcatchers will be taken as a result of construction of the proposed project.

Incidental take is expected to be in the form of harm as defined in 50 CFR § 17.3, due to the direct loss of a portion of their foraging and breeding habitat and increased displacement by project work that could result in death or injury and reproductive loss.

The take exemption will be exceeded if more than:

IT 1. Three pairs of gnatcatchers are documented within the action area; or

IT 2. More than 422.1 acres of modeled gnatcatcher habitat is permanently altered, or 16.4 acres of modeled gnatcatcher habitat is temporarily disturbed as a result of project implementation.

Least Bell's Vireo

We anticipate that up to 2 pairs of vireos will be taken as a result of construction of the proposed project.

Incidental take is expected to be in the form of harm as defined in 50 CFR § 17.3, due to the direct loss of a portion of their foraging and breeding habitat and increased displacement by project work that could result in death or injury and reproductive loss.

The take exemption will be exceeded if more than:

IT 3. Two pairs of vireos are documented within the action area; or

IT 4. More than 6 acres of modeled vireo habitat is permanently altered or 3.0 acres of modeled vireo habitat is temporarily disturbed as a result of project implementation.

Southwestern Willow Flycatcher

We anticipate that up to 1 pair of flycatchers will be taken as a result of construction of the proposed project.

Incidental take is expected to be in the form of harm as defined in 50 CFR § 17.3, due to the direct loss of a portion of their foraging and breeding habitat and increased displacement by project work that could result in death or injury and reproductive loss.

The take exemption will be exceeded if more than:

IT 5. One pair of flycatchers are documented within the action area; or

IT 6. More than 6 acres of modeled flycatcher habitat is permanently altered or 3.0 acres of modeled flycatcher habitat is temporarily disturbed as a result of project implementation.

Arroyo Toad

The exact distribution and population size of arroyo toads is difficult to determine due to the dynamic conditions associated with their habitat and biology and because detection of arroyo toads outside of the breeding season is difficult. In addition, finding dead or injured arroyo toads within the construction area is unlikely as the individuals may be underground during construction activities, and the species is cryptic making them difficult to recognize or detect.

Because we do not have site specific data regarding the density of arroyo toads at this location, it is difficult to accurately quantify the amount of take that will occur. Nevertheless, based on the best available scientific information, we have established the following take thresholds for arroyo toad:

The take exemption will be exceeded if:

IT 7. Death or injury of up to 3 juvenile or adult arroyo toads from the removal of 96 acres of modeled arroyo toad habitat. Because it is likely that few of these arroyo toads will be observed, the amount or extent of incidental take will be exceeded if more than the specified amount of habitat is cleared/graded or if more than one juvenile or adult arroyo toad is found dead or injured as a result of construction-related project activities.

IT 8. Capture and relocation of up to 7 juvenile or adult arroyo toads within the construction footprint. The amount or extent of incidental take will be exceeded if more than 7 juvenile or adult arroyo toads are captured and relocated or if more than one juvenile or adult arroyo toad is accidentally killed or injured as a direct result of capture and relocation efforts.

IT 9. Death or injury of up to 3 juvenile or adult arroyo toads associated with

restoration of temporary impact areas. Because it is likely that few of these arroyo toads will be observed, the amount or extent of incidental take will be exceeded if more than one arroyo toad is observed dead or injured in association with restoration activities.

REASONABLE AND PRUDENT MEASURES

The Authority is implementing significant conservation measures as part of the proposed action to minimize the incidental take of gnatcatchers, vireos, flycatchers, and arroyo toads. In addition, the following reasonable and prudent measures (RPM) are necessary to monitor and report the take of gnatcatchers, vireos, flycatchers, and arroyo toads:

RPM 1. The Authority will monitor and report any project-related incidental take of gnatcatchers to the CFWO.

RPM 2. The Authority will monitor and report any project-related incidental take of vireos to the CFWO.

RPM 3. The Authority will monitor and report any project-related incidental take of flycatchers to the CFWO.

RPM 4. The Authority will monitor and report any project-related incidental take of arroyo toads to the CFWO.

TERMS AND CONDITIONS

To be exempt from the prohibitions of section 9 of the Act, the Authority must comply with the following terms and conditions (TC), which implement the reasonable and prudent measure described above and outline monitoring and reporting requirements. These terms and conditions are non-discretionary:

Coastal California Gnatcatcher

TC 1.1 Prior to initiating project work, three preconstruction surveys will be conducted within all modeled gnatcatcher habitat in or within 500 feet of the California High Speed Rail, Palmdale to Burbank Project footprint, within 30 days prior to initiation of vegetation removal activities, to verify that no more than 3 gnatcatcher pairs will be harmed as a result of the project. If it is the wrong time of year for effective surveys, at the discretion of the Project Biologist, a copy of project surveys conducted within the previous year may be submitted.

TC 1.2 Prior to initiating work, the Authority will provide to the CFWO a map showing the distribution of gnatcatchers relative to the project footprint and an estimate of the number of gnatcatchers that will be impacted by the project or confirm in writing that the number of gnatcatchers that will be impacted by the project remains correct.

TC 1.3 The Authority will notify the CFWO of the area of gnatcatcher habitat cleared within 30 days of completing removal of gnatcatcher habitat. The purpose of this notification is to ensure that impacts to gnatcatcher habitat from the proposed project do not exceed the take thresholds.

Least Bell's Vireo

TC 2.1 Prior to initiating project work, three preconstruction surveys will be conducted within all modeled vireo habitat in or within 500 feet of the California High Speed Rail, Palmdale to Burbank Project footprint, within 30 days prior to initiation of vegetation removal activities, to verify that no more than 2 vireo pairs will be harmed as a result of the project. If it is the wrong time of year for effective surveys, at the discretion of the Project Biologist, a copy of project surveys conducted within the previous year may be submitted.

TC 2.2 Prior to initiating work, the Authority will provide to the CFWO a map showing the distribution of vireos relative to the project footprint and an estimate of the number of vireos that will be impacted by the project or confirm in writing that the number of vireos that will be impacted by the project remains correct.

TC 2.3 The Authority will notify the CFWO of the area of vireo habitat cleared within 30 days of completing removal of vireo habitat. The purpose of this notification is to ensure that impacts to vireo habitat from the proposed project do not exceed the take thresholds.

Southwestern Willow Flycatcher

TC 3.1 Prior to initiating project work, three preconstruction surveys will be conducted within all modeled flycatcher habitat in or within 500 feet of the California High Speed Rail, Palmdale to Burbank Project footprint, within 30 days prior to initiation of vegetation removal activities, to verify that no more than 1 flycatcher pairs will be harmed as a result of the project. If it is the wrong time of year for effective surveys, at the discretion of the Project Biologist, a copy of project surveys conducted within the previous year may be submitted.

TC 3.2 Prior to initiating work, the Authority will provide to the CFWO a map showing the distribution of flycatchers relative to the project footprint and an estimate of the number of flycatchers that will be impacted by the project or confirm in writing that the number of flycatchers that will be impacted by the project remains correct.

TC 3.3 The Authority will notify the CFWO of the area of flycatcher habitat cleared within 30 days of completing removal of flycatcher habitat. The purpose of this notification is to ensure that impacts to flycatcher habitat from the proposed project do not exceed the take thresholds.

Arroyo Toad

TC 4.1 Within 30 calendar days of the completion of project activities within arroyo toad habitat, the Authority will provide the CFWO with a report documenting the area of arroyo toad habitat impacted, the number of dead or injured arroyo toads observed in the action area, and the number of arroyo toads captured and released. The report will include information on the gender, life history stage, and general condition of all arroyo toads that were killed, injured, and captured/released. It will also include an assessment of how or why arroyo toads may have been injured or killed and information on where toads were captured and released and observed physiological responses of relocated arroyo toads.

TC 4.2 The Authority will include any observations of arroyo toads and potential effects to arroyo toads in annual reports describing the progress of the temporary impact area restoration.

TC 4.3 The Authority will report incidences of take (observed death or injury or capture and relocation of arroyo toads) to the CFWO within 3 days. All field notes and other documentation generated by the biological monitor will be made available to the CFWO upon request.

TC 4.4 If the level of take exempted in this biological opinion is exceeded at any time, the Authority will immediately contact the CFWO.

DISPOSITION OF SICK, INJURED, OR DEAD SPECIMENS

Upon locating dead, injured, or sick individuals of threatened or endangered species, initial notification must be made to the CFWO within 24 hours by email.[2] Email notification must be made within 5 calendar days and include the collection date and time, the location of the animal, and any other pertinent information. Care must be taken in handling sick or injured animals to ensure effective treatment and care, and in handling dead specimens to preserve biological material in the best possible state. The remains of specimens shall be offered to educational or research institutions holding the appropriate State and Federal permits (e.g., San Diego Natural History Museum, San Diego). Arrangements regarding proper disposition of potential museum specimens shall be made with the institution by the authorized biologist prior to implementation of the action.

CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery plans or to develop information. We have not identified any additional

[2] Jonathan_D_Snyder@fws.gov

conservation recommendations that will further benefit the gnatcatcher, vireo, flycatcher, arroyo toad, and slender-horned spineflower within the action area.

REINITIATION NOTICE

This concludes formal consultation regarding California High Speed Rail Palmdale to Burbank Section as outlined in materials submitted to us. Reinitiation of consultation is required and will be requested by the Authority or by the Service, where discretionary Federal involvement or control over the action has been retained or is authorized by law and:

1. If the amount or extent of taking specified in the incidental take statement is exceeded;

2. If new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered;

3. If the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this biological opinion; or

4. If a new species is listed or critical habitat designated that may be affected by the identified action.

If you have any questions regarding this biological opinion, please contact Jonathan Snyder[3] of this office at 760-431-9440, extension 208.

Sincerely,

Scott A. Sobiech
Field Supervisor

Appendices

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Dellith, C. 2023. Biologist, U.S. Fish and Wildlife Service. Email correspondence to Sally Brown, Biologist, U.S. Fish and Wildlife Service. Dated September 13, 2023. Subject: RE: vireos at Santa Clara River.

Figure 2-2 SR14A Overview Map

Figure 1. SR-14A Build Alternative (Source: Authority 2023).

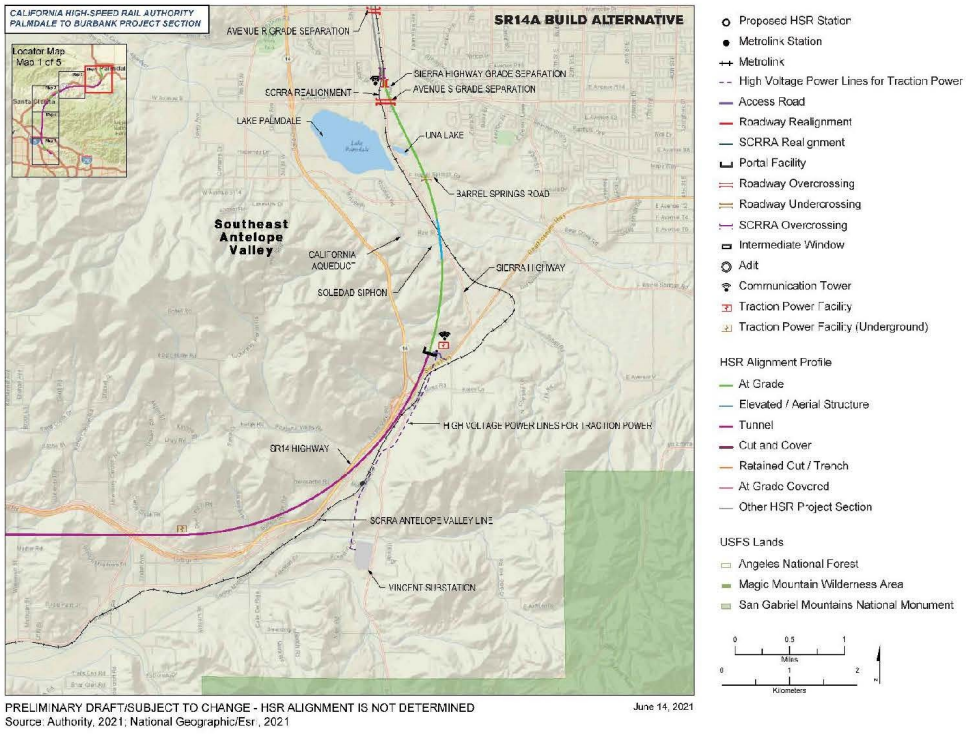

Figure 2-3 SR14A Build Alternative (Map 1 of 5)

Figure 2. SR-14A Build Alternative Detail Map 1 of 5 (Source: Authority 2023).

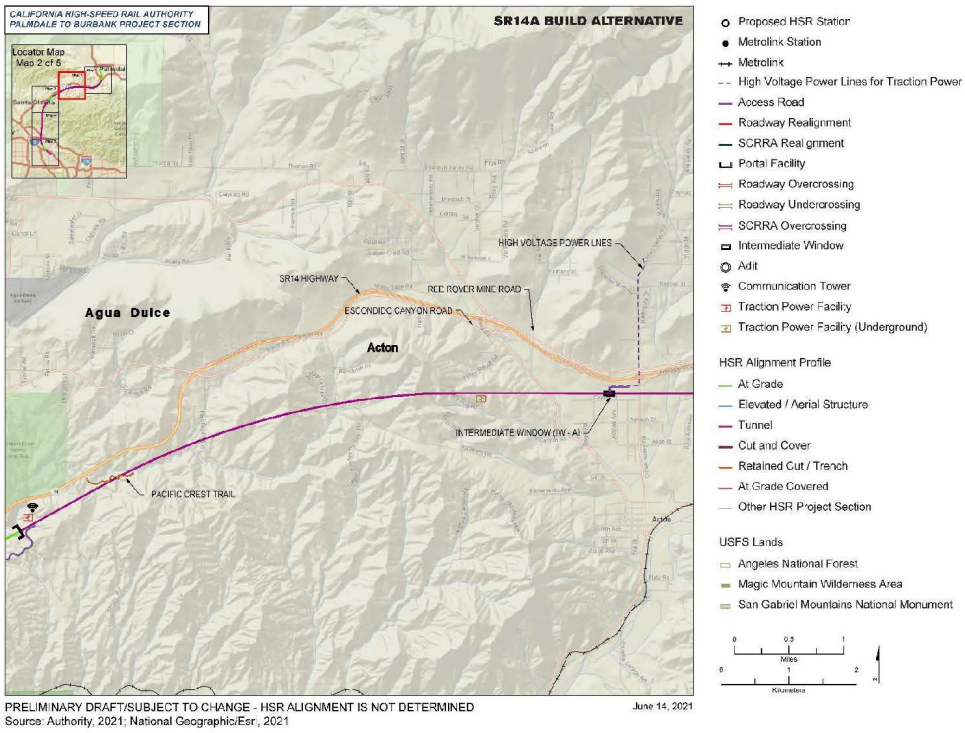

Figure 2-4 SR14A Build Alternative (Map 2 of 5)

Figure 3. SR-14A Build Alternative Detail Map 2 of 5 (Source: Authority 2023)

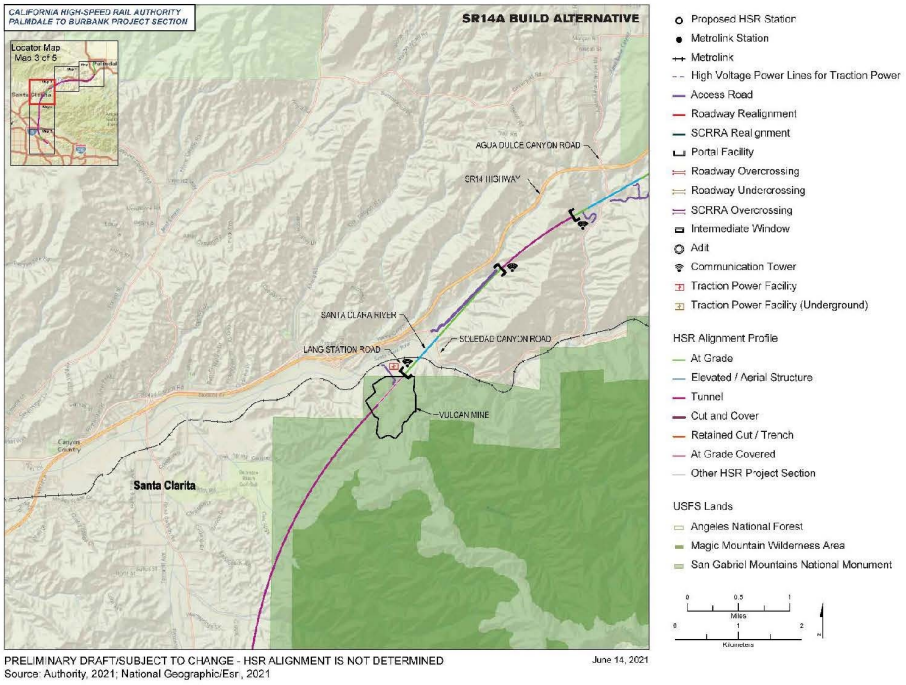

Figure 2-5 SR14A Build Alternative (Map 3 of 5)

Figure 4. SR-14A Build Alternative Detail Map 3 of 5 (Source: Authority 2023).

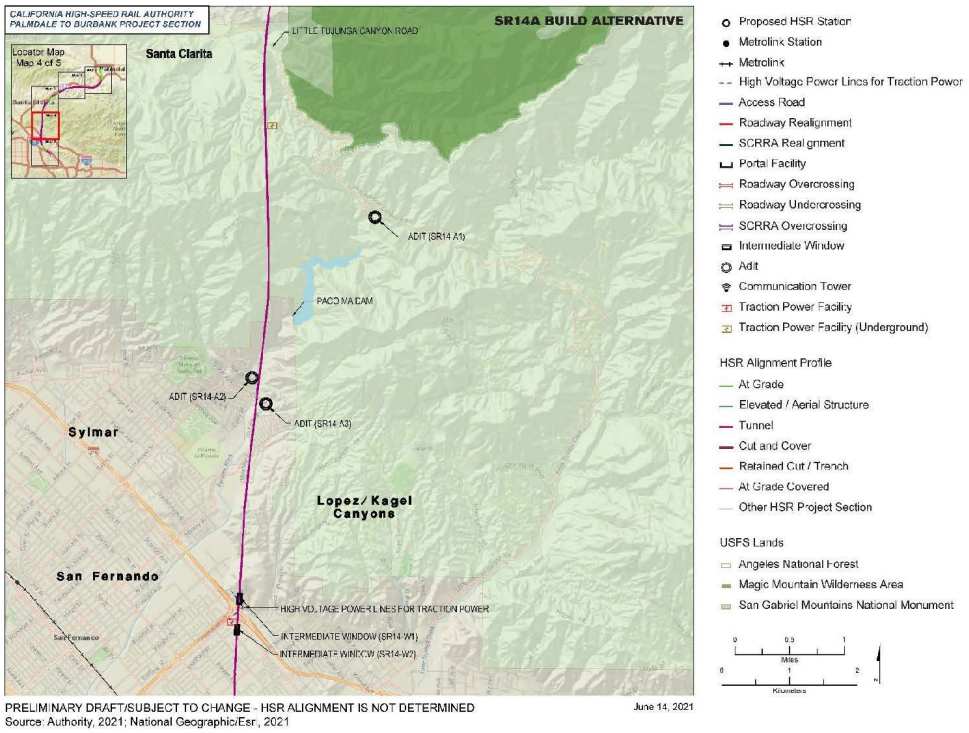

Figure 2-6 SR14A Build Alternative (Map 4 of 5)

Figure 5. SR-14A Build Alternative Detail Map 4 of 5 (Source: Authority 2023).

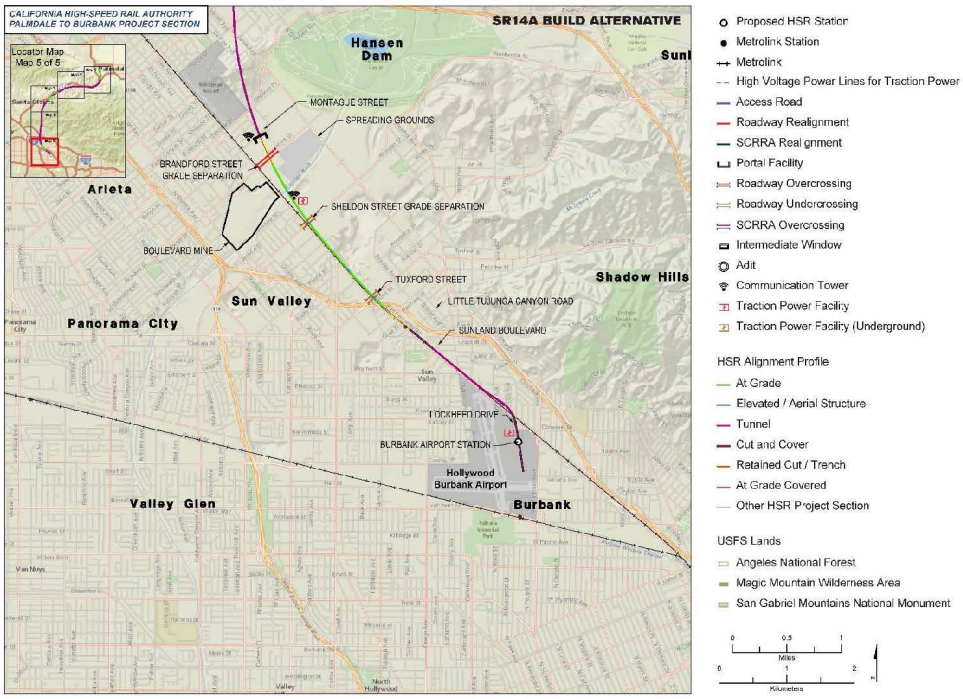

Figure 2-7 SR14A Build Alternative (Map 5 of 5)

Figure 6. SR-14A Build Alternative Detail Map 5 of 5 (Source: Authority 2023).

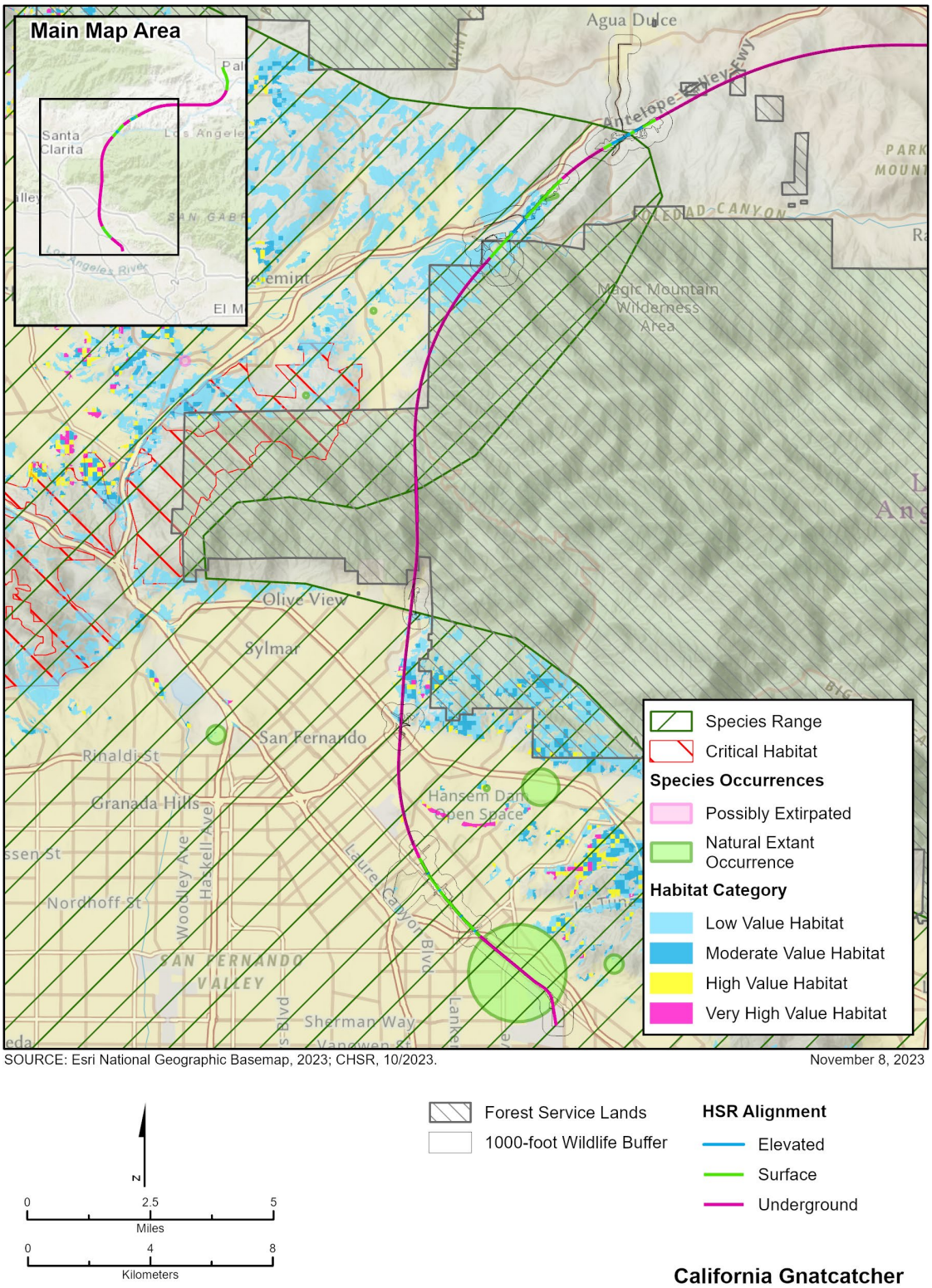

Figure 7. Coastal California Gnatcatcher Modeled Habitat (Source: Authority 2023).

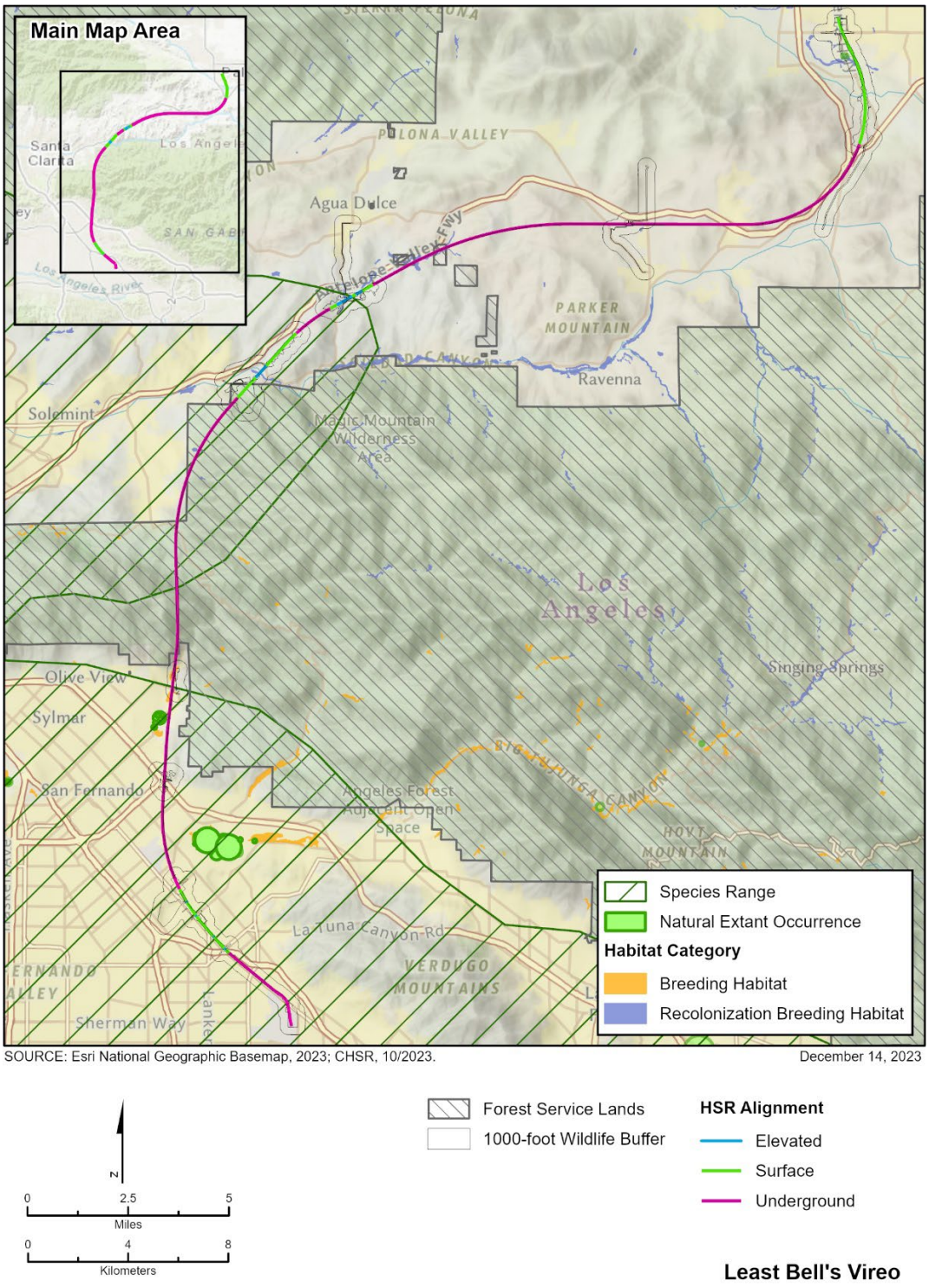

Figure 8. Least Bell's Vireo Modeled Habitat (Source: Authority 2023).

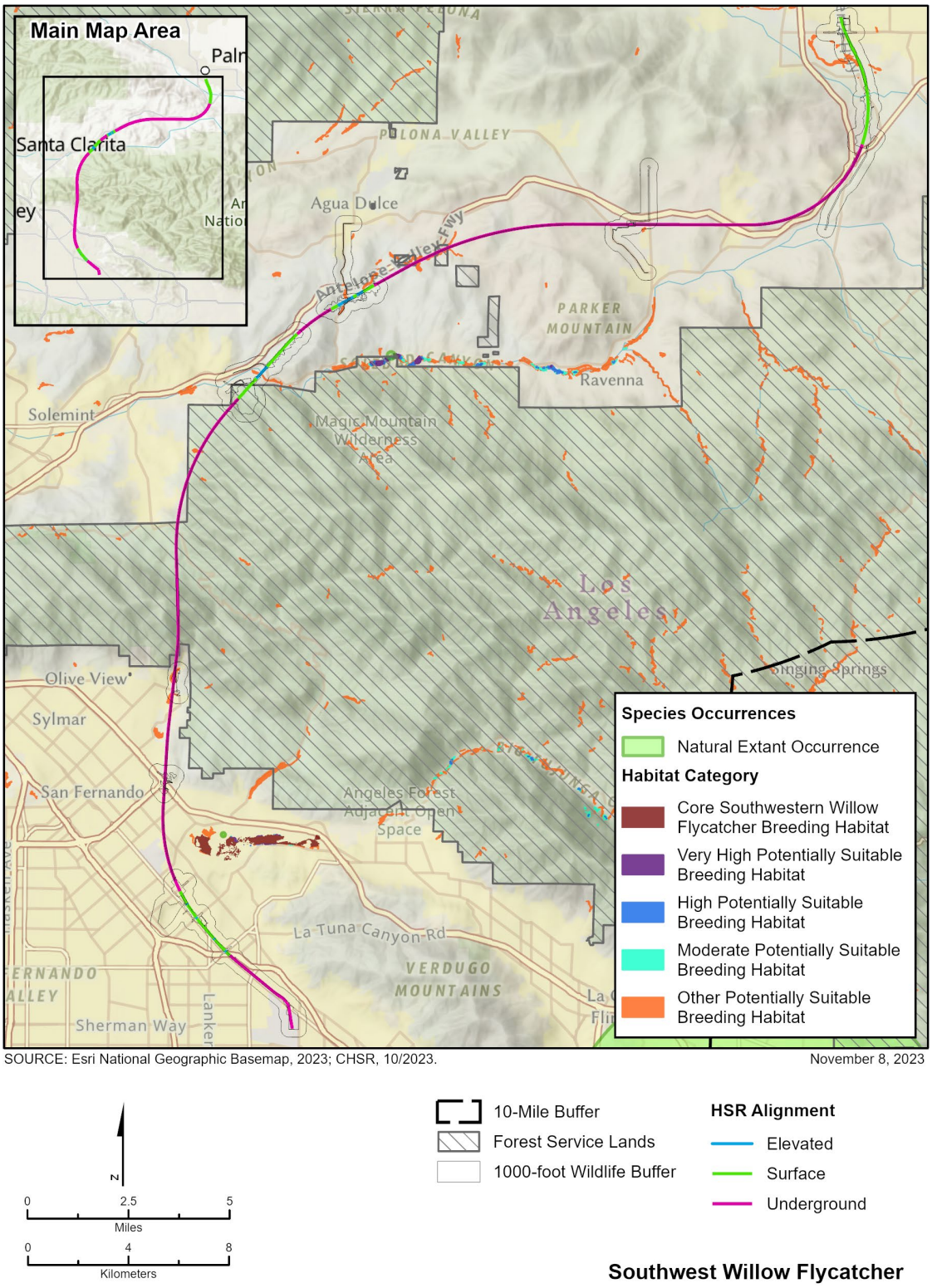

Figure 9. Southwestern Willow Flycatcher Modeled Habitat (Source: Authority 2023).

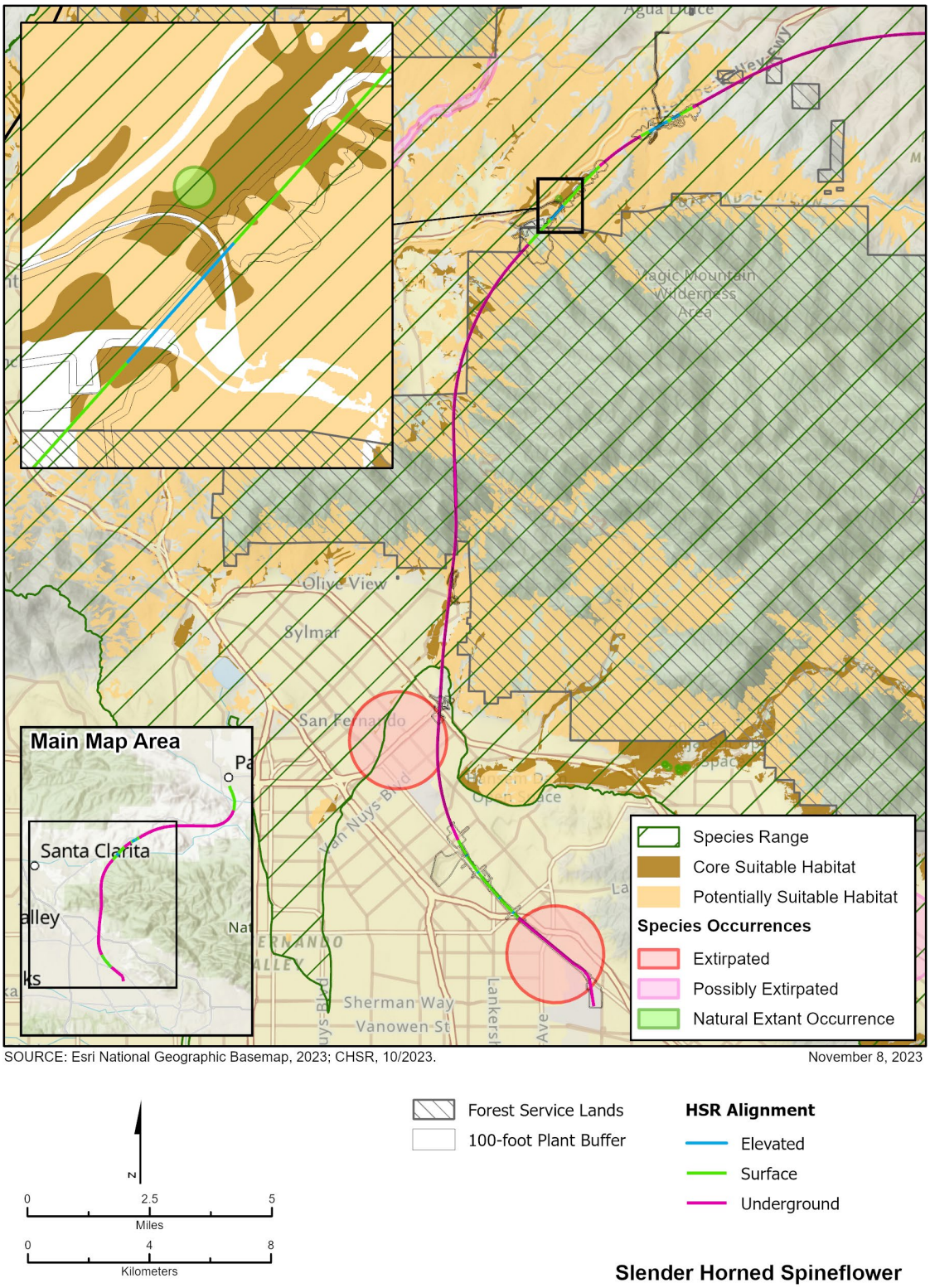

Figure 10. Slender-Horned Spineflower Modeled Habitat (Source: Authority 2023).

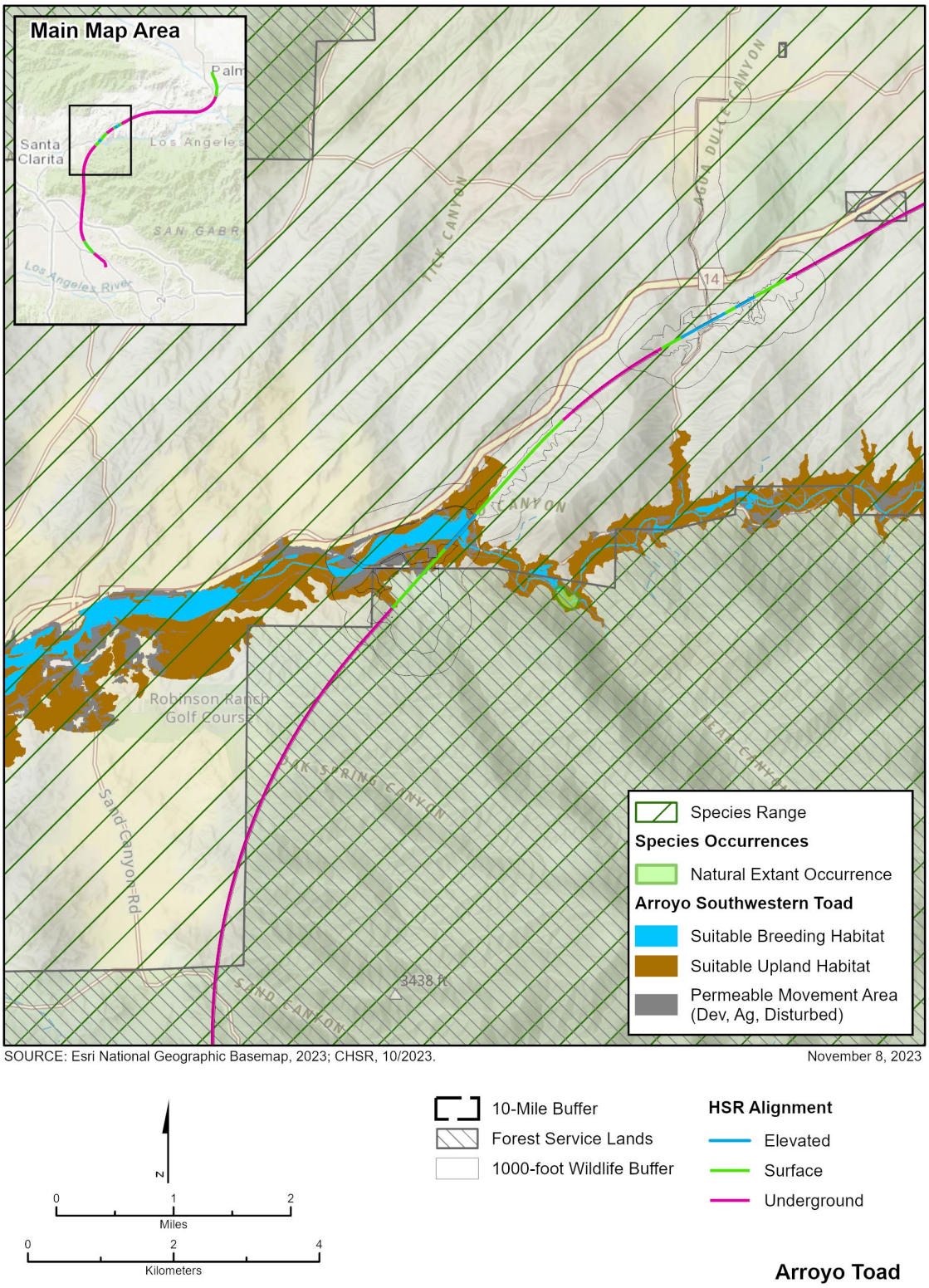

Figure 11. Arroyo Toad Modeled Habitat (Source: Authority 2023).

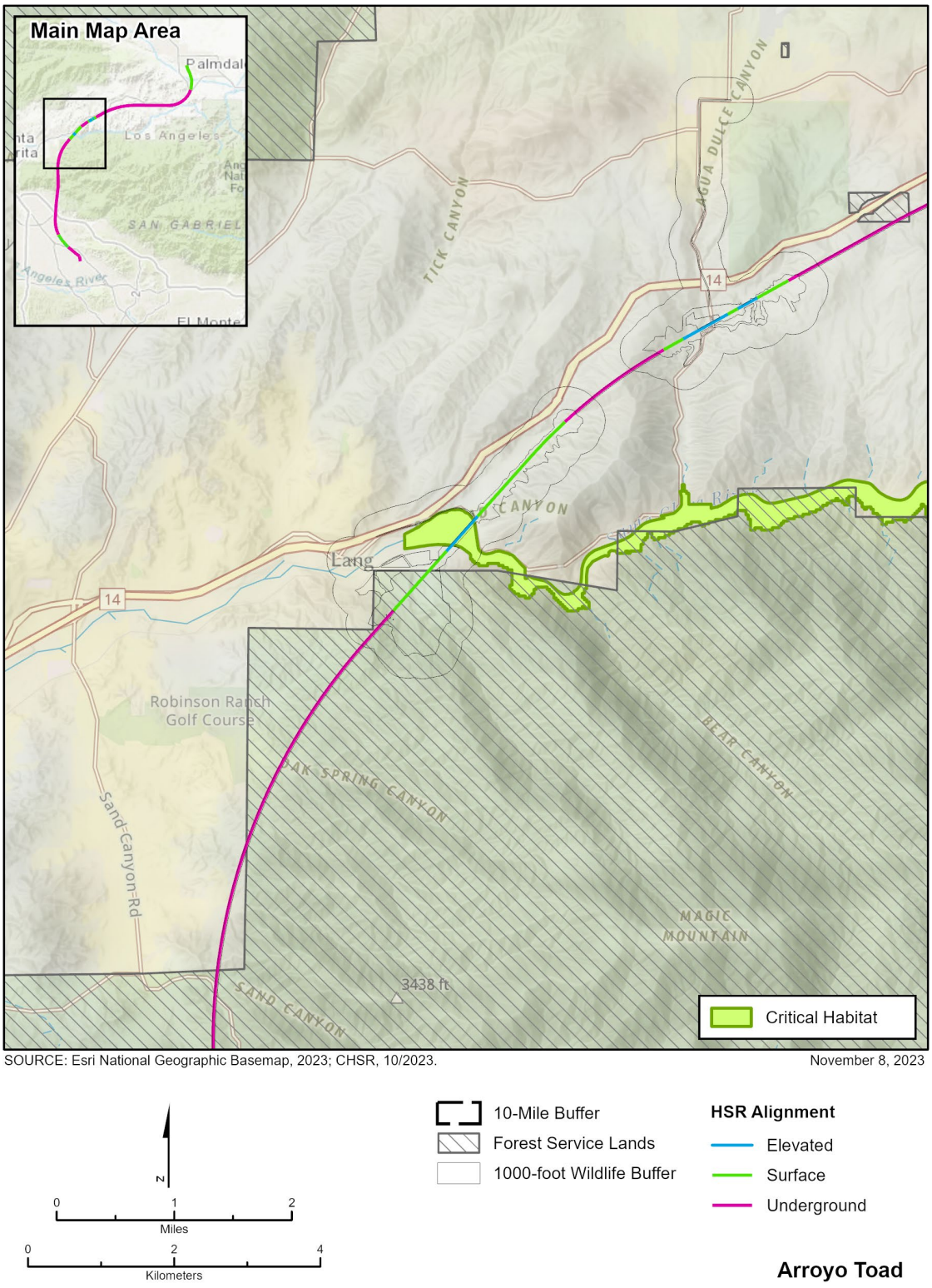

Figure 12. Arroyo Toad Critical Habitat (Source: Authority 2023).

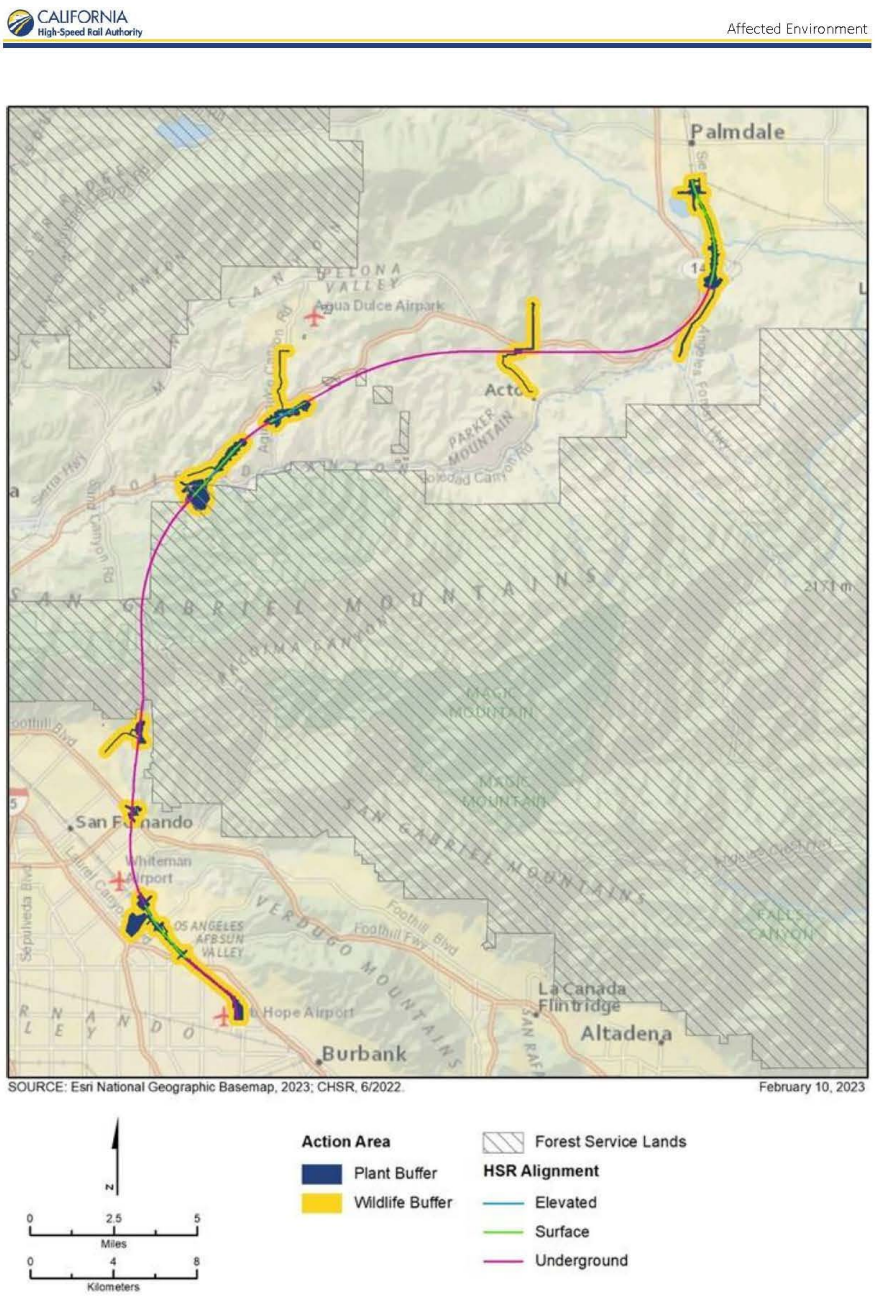

Figure 13. SR-14A Build Alternative Action Area (Source: Authority 2023).

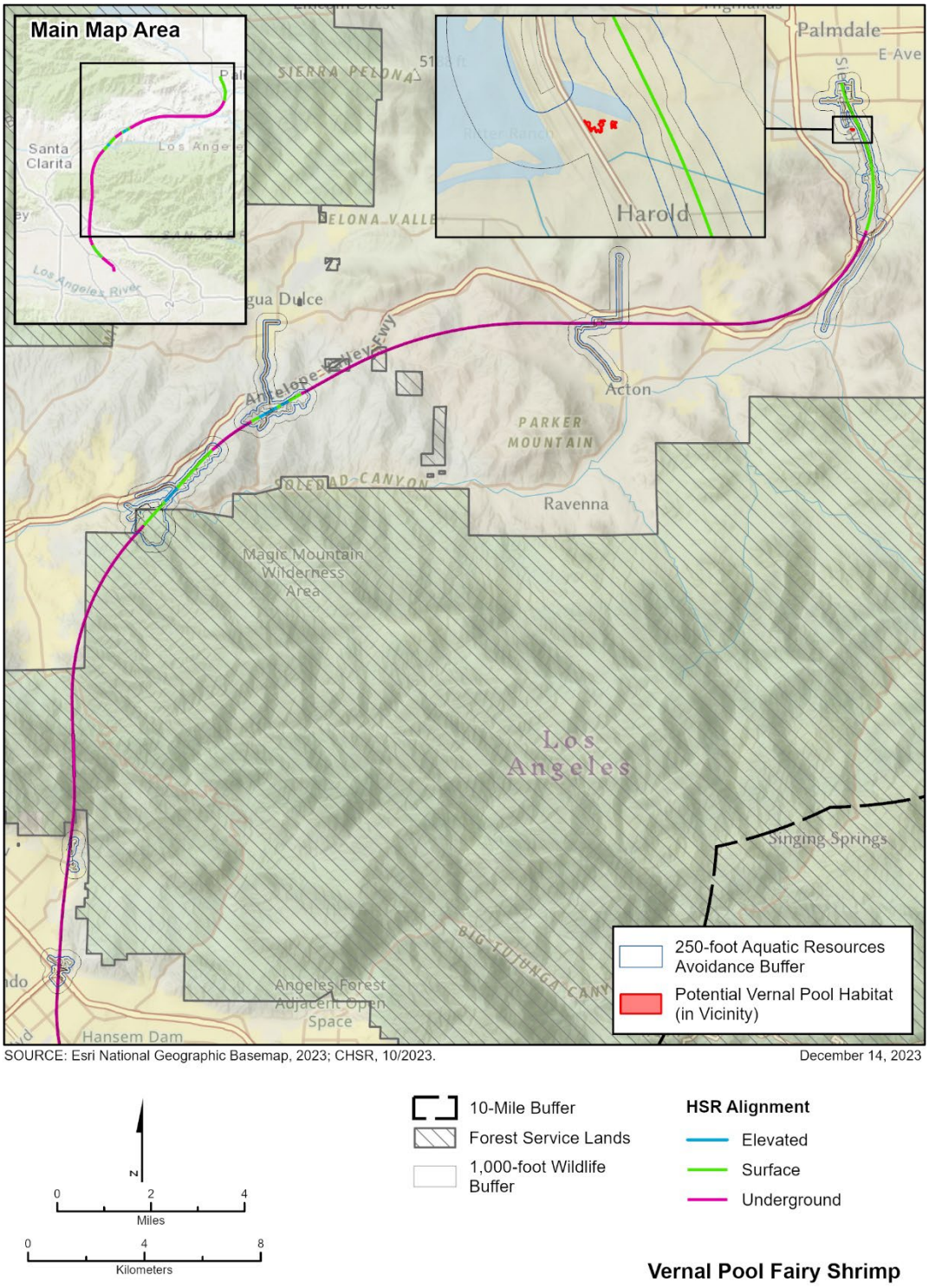

Figure 14. Vernal Pool Fairy Shrimp Habitat (Source: Authority 2023).

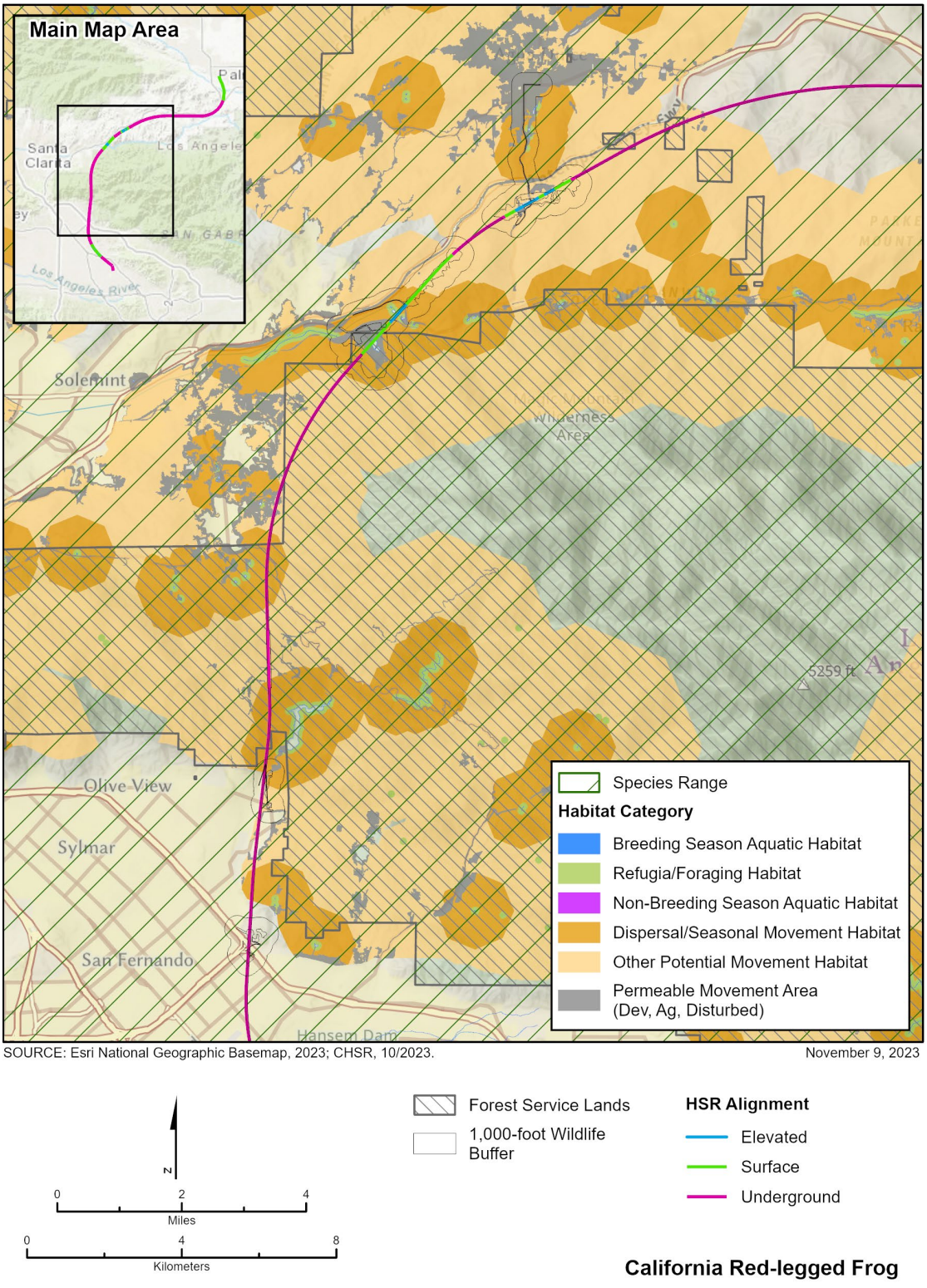

Figure 15. California Red-Legged Frog Modeled Habitat (Source: Authority 2023).

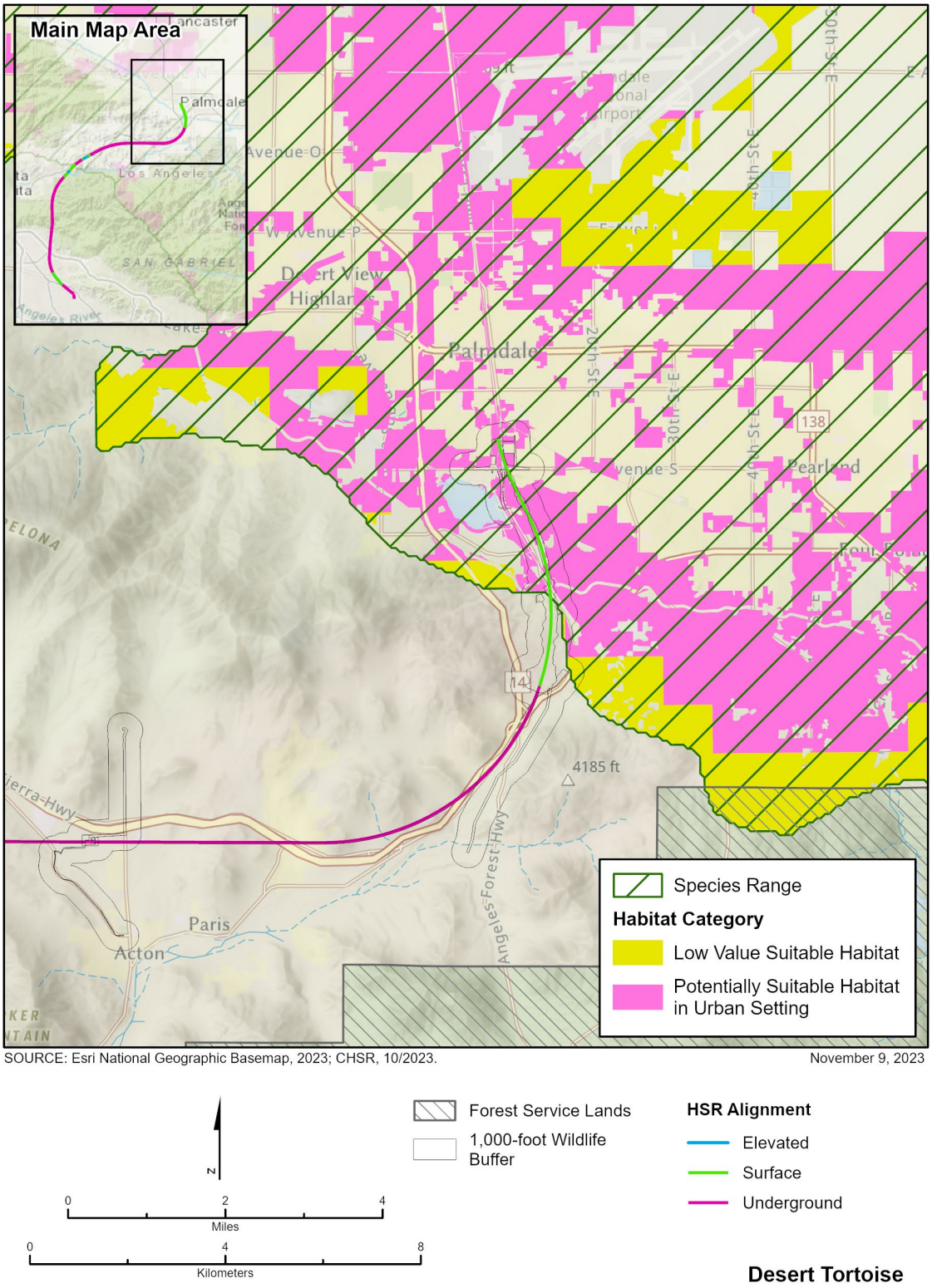

Figure 16. Desert Tortoise Modeled Habitat (Source: Authority 2023).

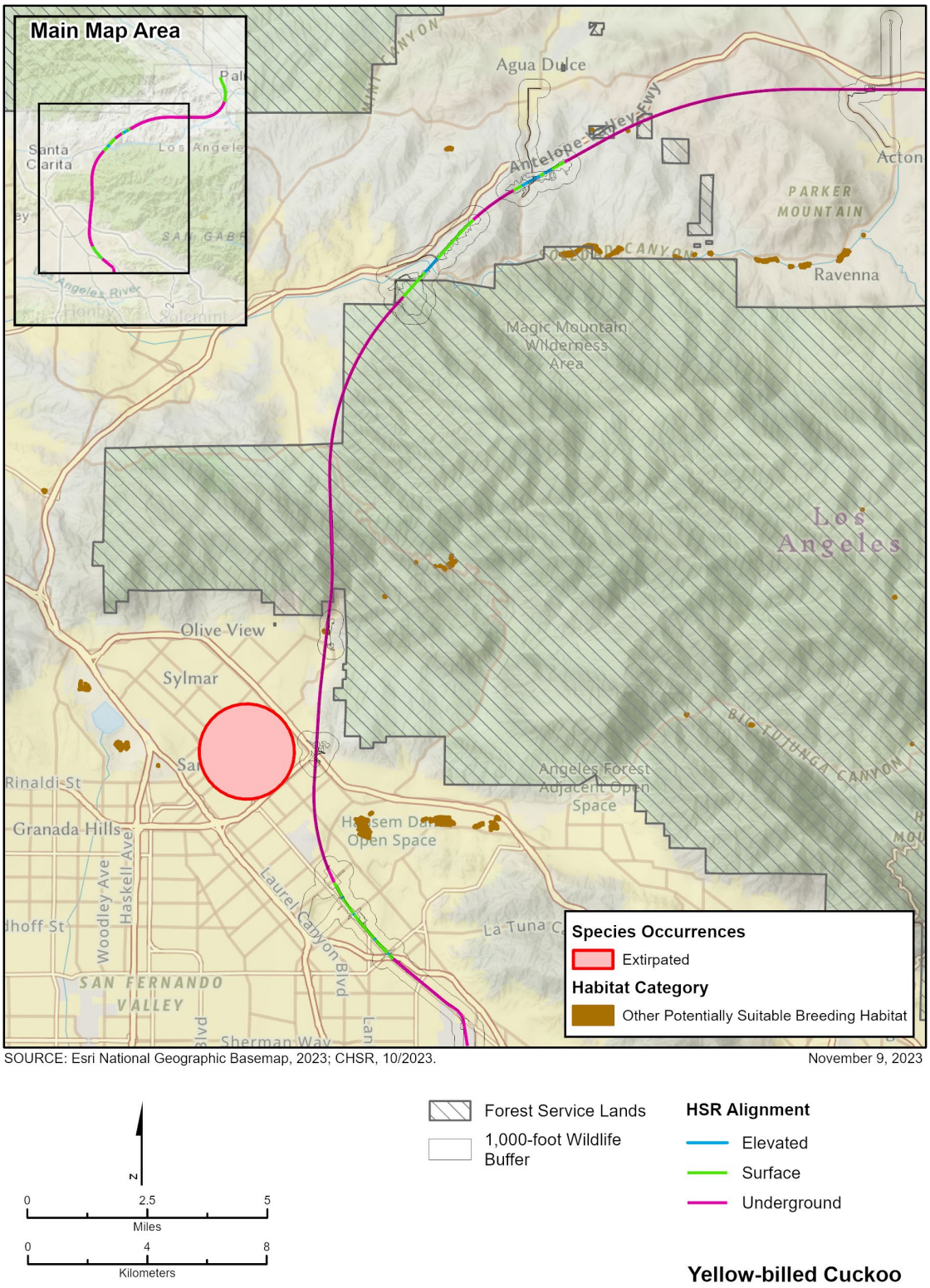

Figure 17. Yellow-Billed Cuckoo Modeled Habitat (Source: Authority 2023).

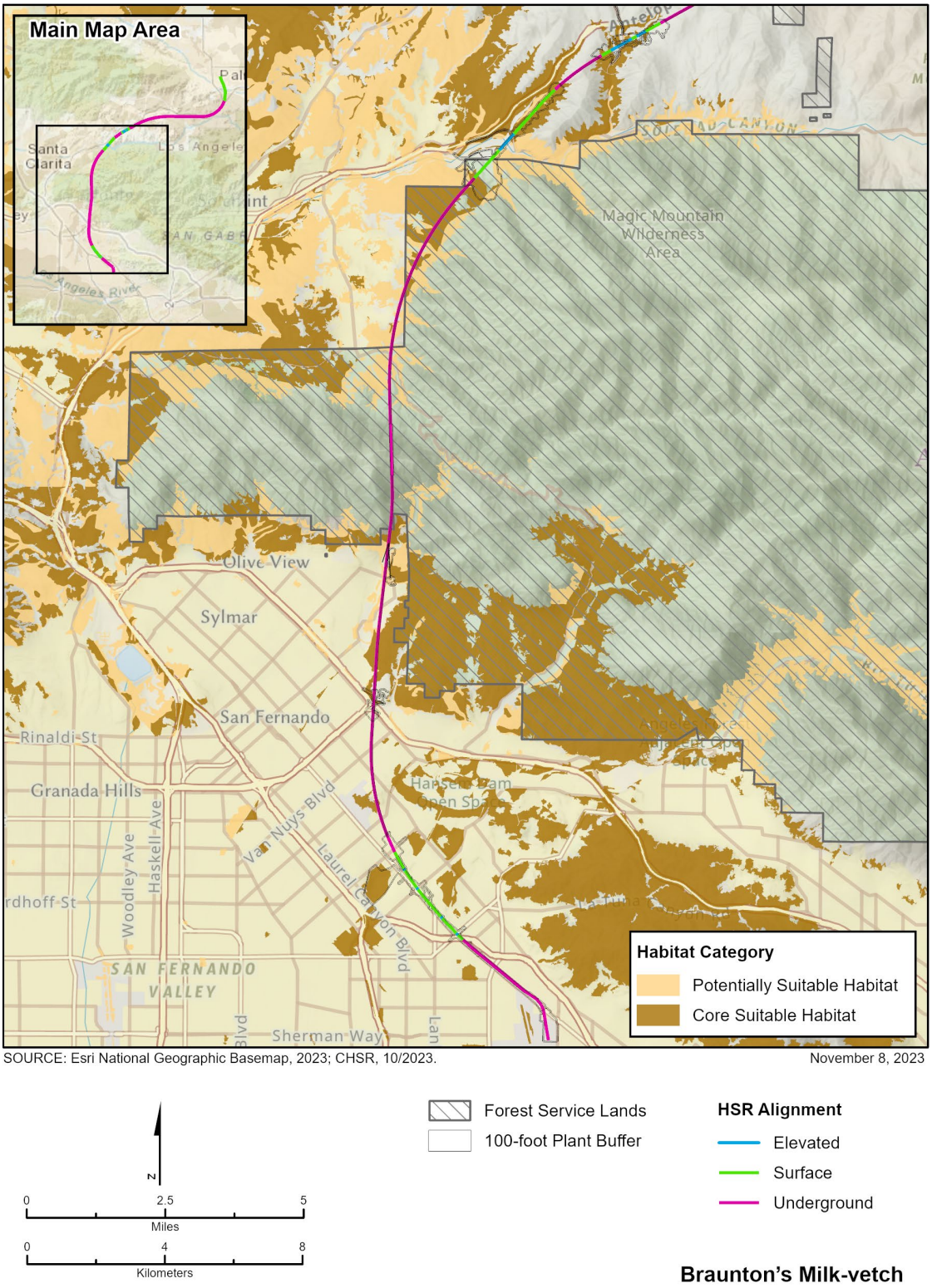

Figure 18. Braunton's Milk-Vetch Modeled Habitat (Source: Authority 2023).

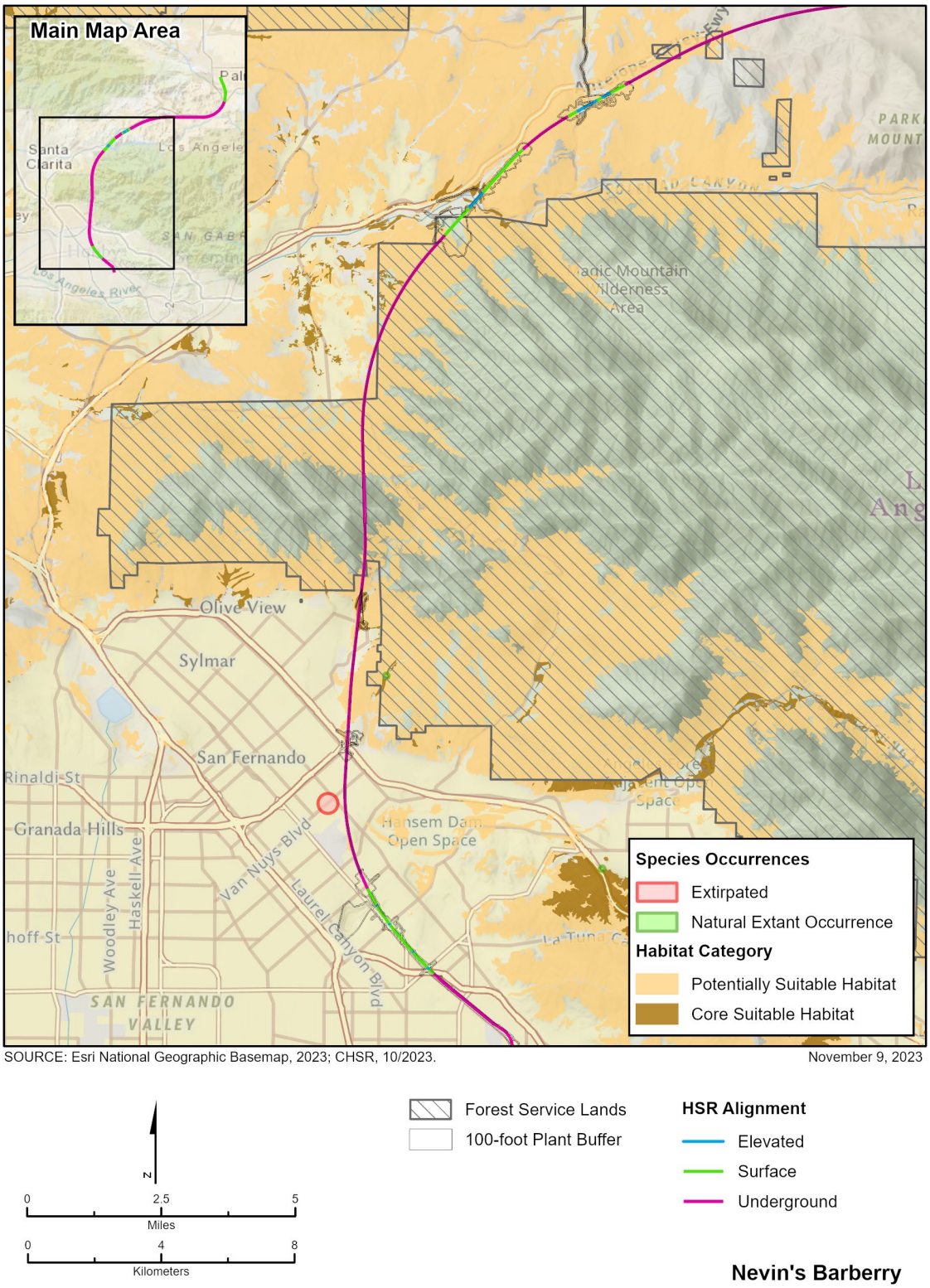

Figure 19. Nevin's Barberry Modeled Habitat (Source: Authority 2023).

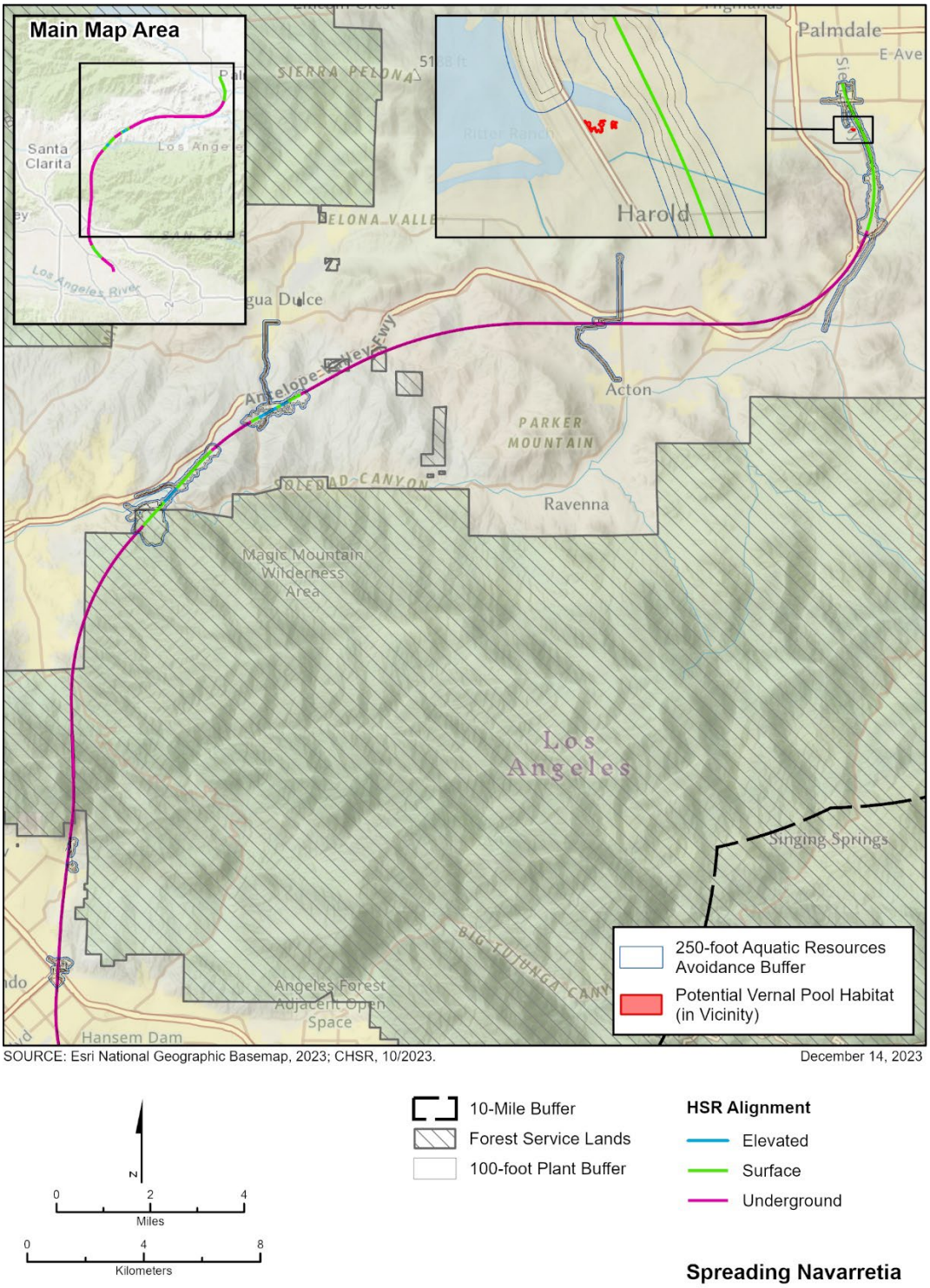

Figure 20. Spreading Navarretia Habitat (Source: Authority 2023).

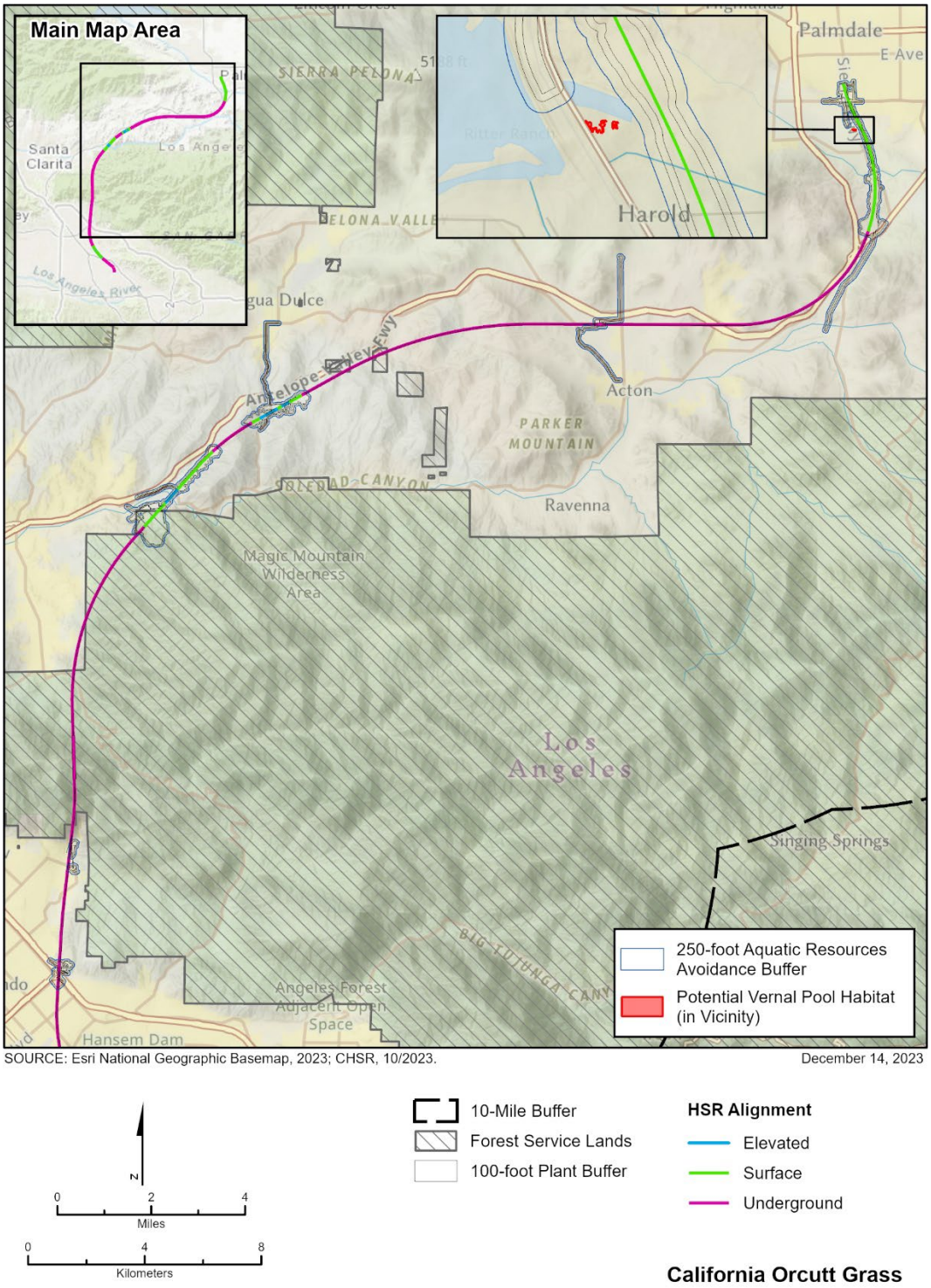

Figure 21. California Orcutt Grass Habitat (Source: Authority 2023).

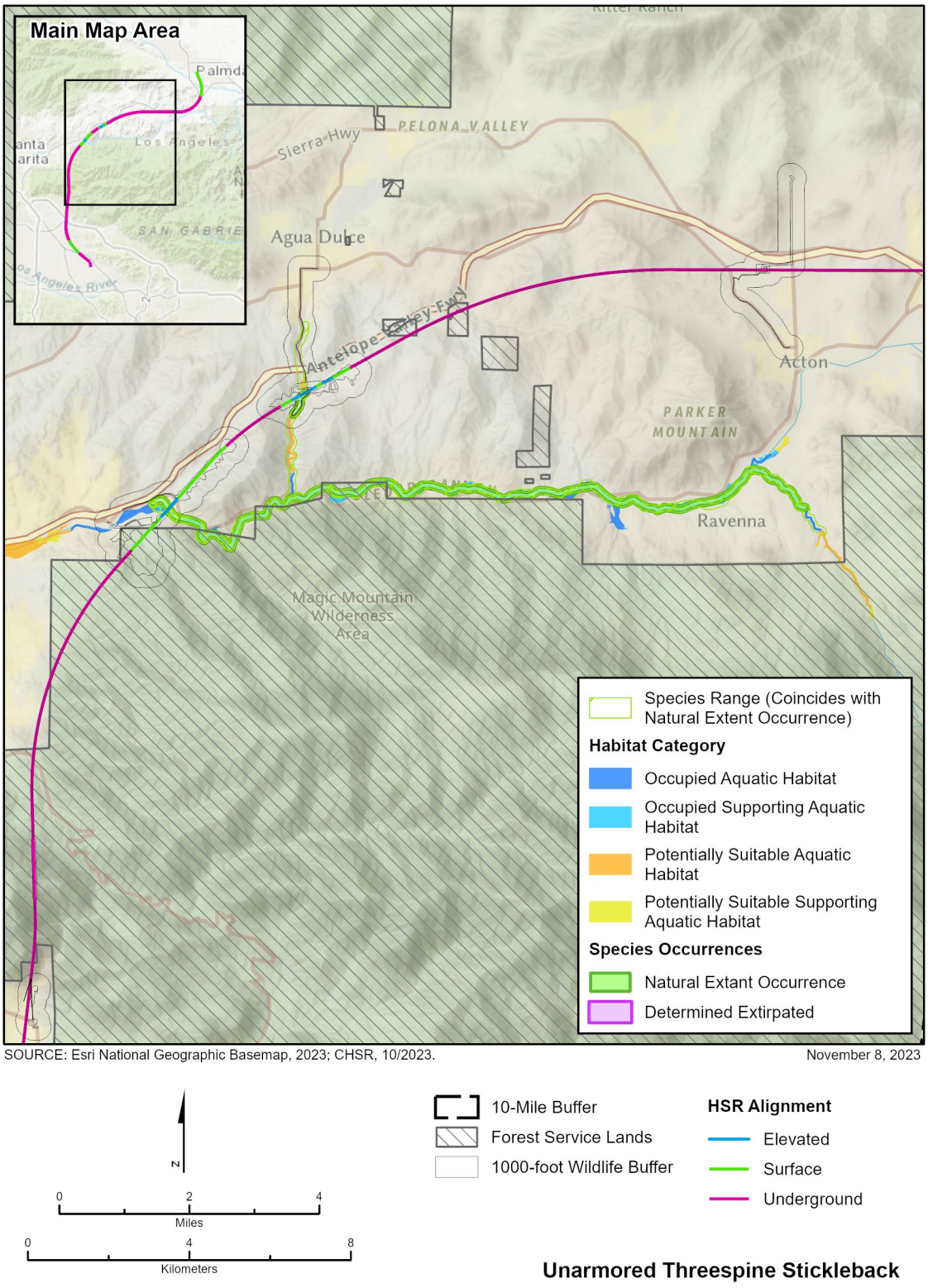

Figure 22. Unarmored Threespine Stickleback Modeled Habitat (Source: Authority 2023).

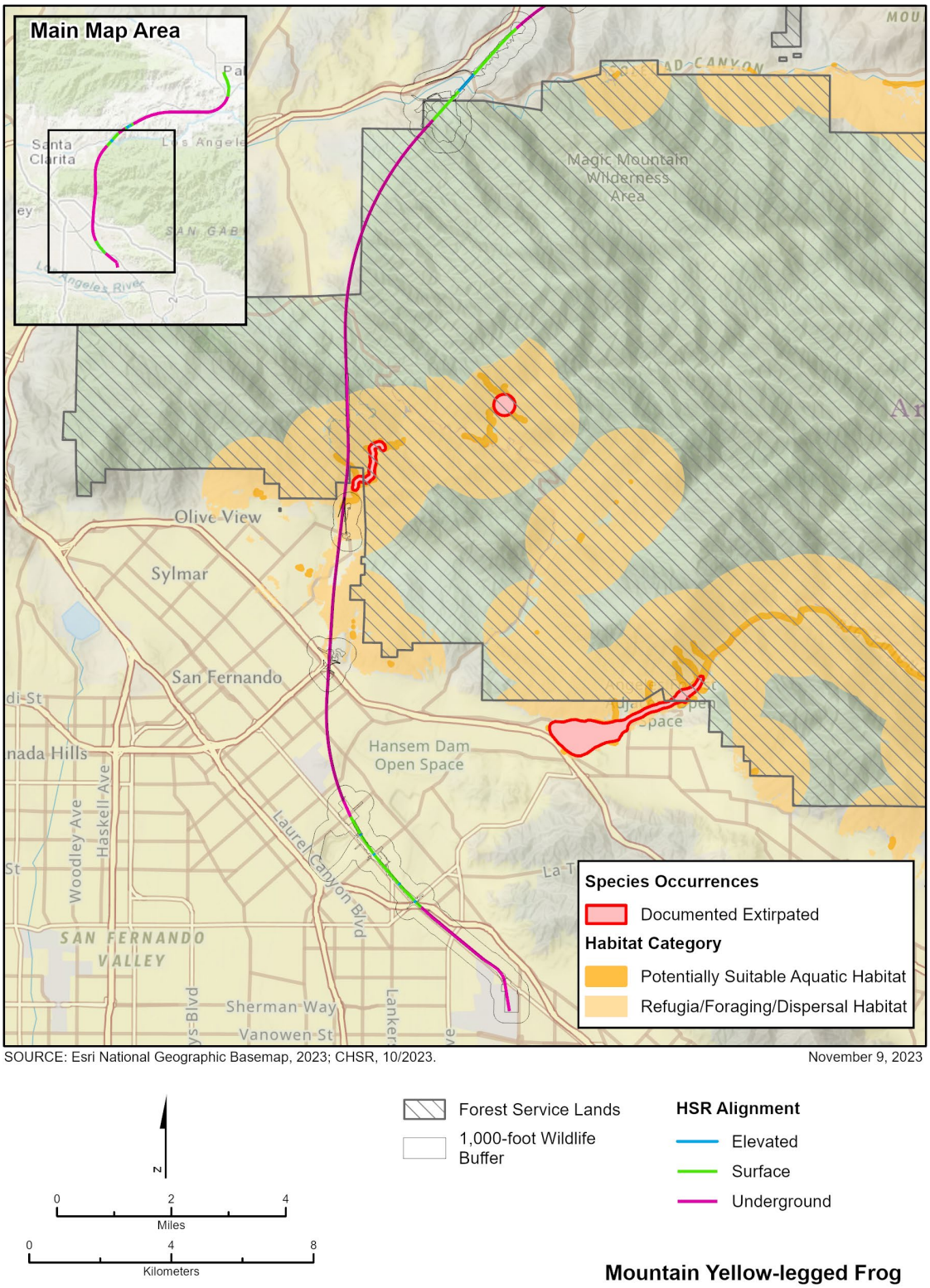

Figure 23. Mountain Yellow-Legged Frog Modeled Habitat (Source: Authority 2023).

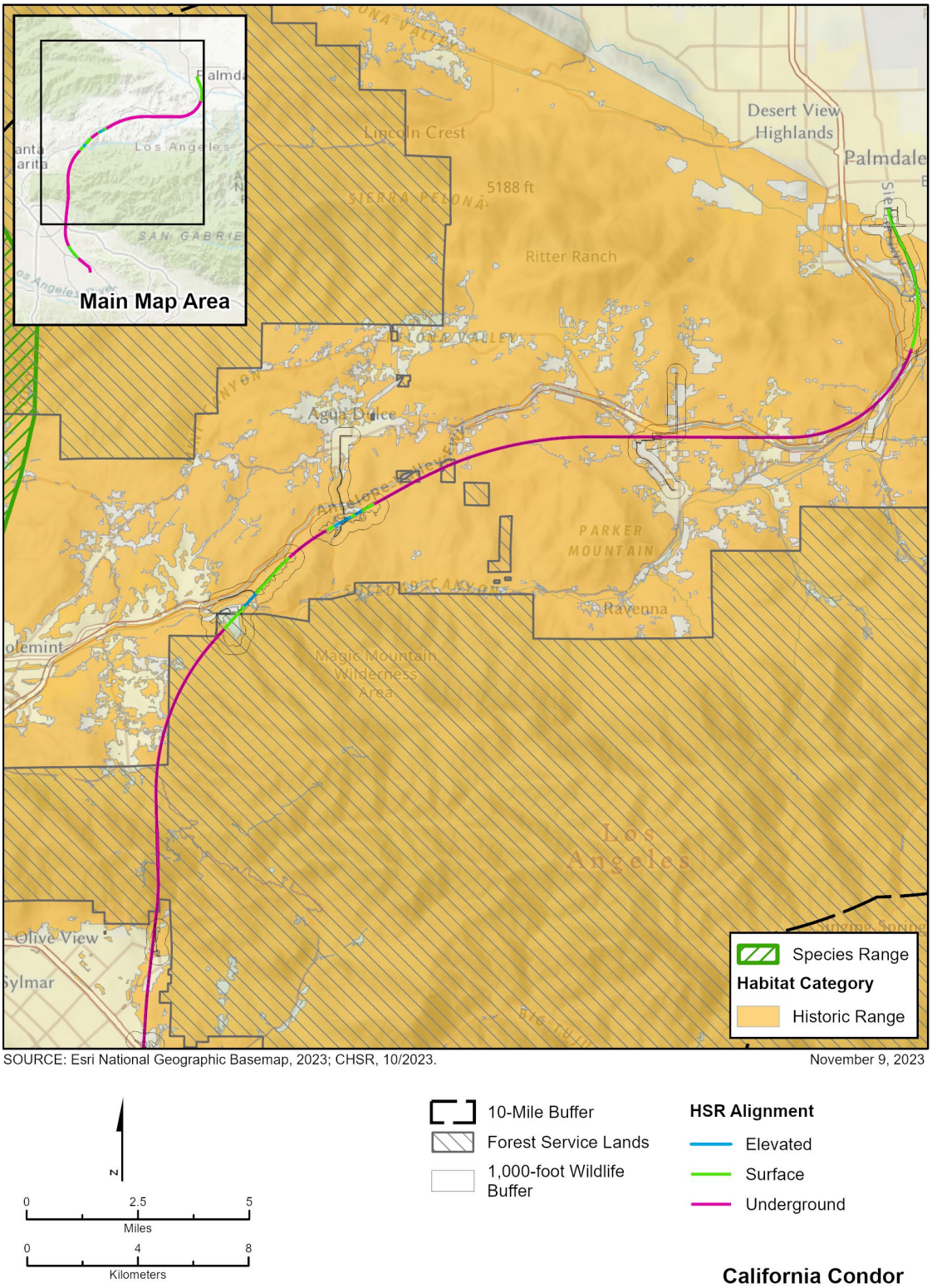

Figure 24. California Condor Modeled Habitat (Source: Authority 2023).

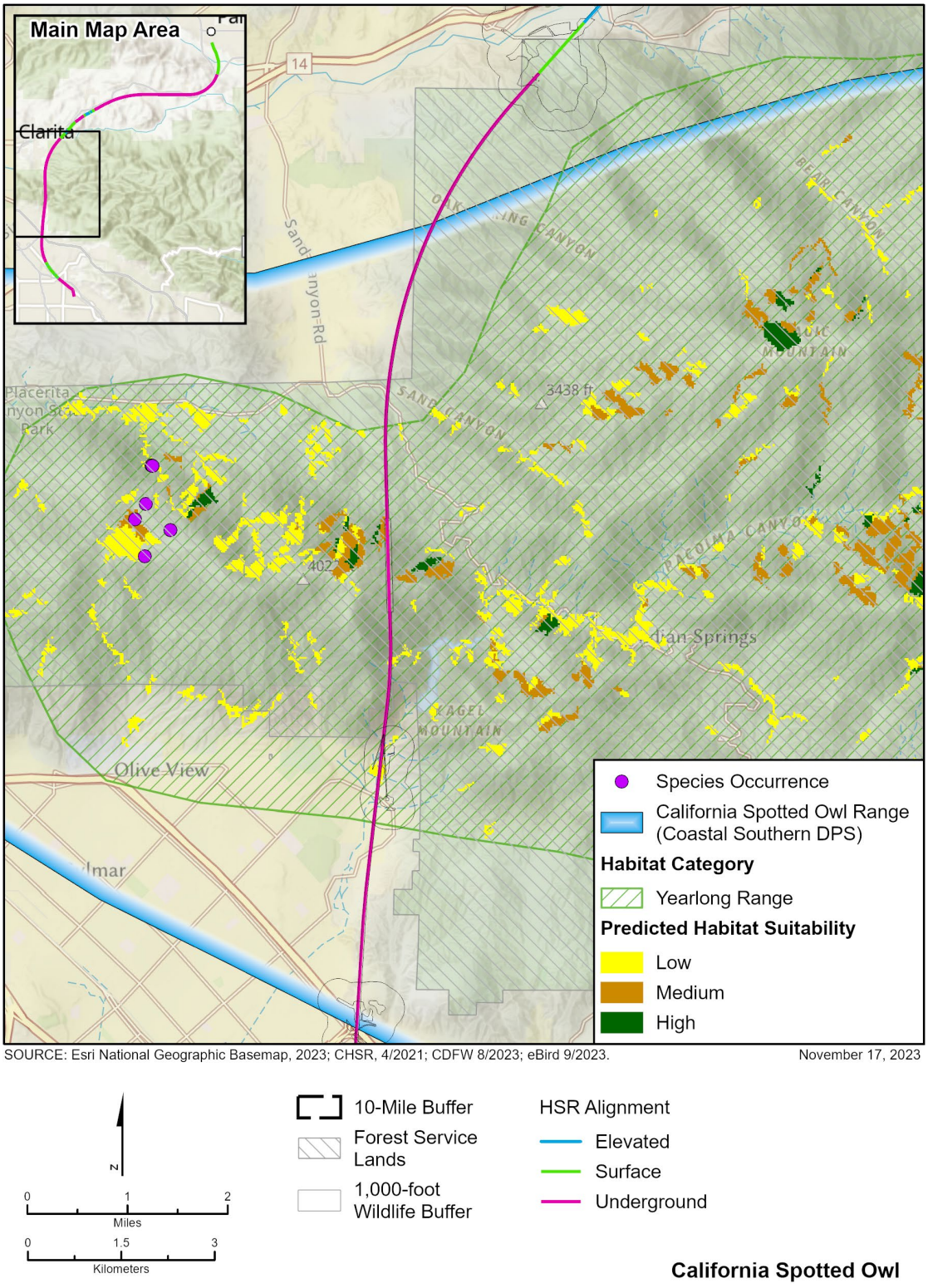

Figure 25. California Spotted Owl Habitat (Source: Authority 2023).

APPENDIX 1

Section 7 Consultation and Conference California High Speed Rail Palmdale to Burbank Section
Los Angeles County, California

NOT LIKELY TO ADVERSELY AFFECT DETERMINATIONS

The following information supports the Service's concurrence with the Authority's not likely to adversely affect determination for the federally threatened vernal pool fairy shrimp, California red-legged frog, desert tortoise, and Yellow-billed cuckoo, and the federally endangered Braunton's milk-vetch, Nevin's barberry, spreading navarretia, California Orcutt grass, unarmored threespine stickleback, mountain yellow-legged frog, and California condor, and the proposed endangered California spotted owl, in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq*.), for the California High Speed Rail Palmdale to Burbank Section, Los Angeles County, California.

Vernal Pool Fairy Shrimp

Vernal pool fairy shrimp surveys were not conducted for the project, but vernal pool assessment was conducted for the project in the winter of 2017. In addition, the CNDDB has records for the species west of the action area in the vicinity of Santa Clarita. Potential habitat for vernal pool fairy shrimp is distributed throughout the project area as shown in Figure 14.

To ensure that impacts to vernal pool fairy shrimp are reduced to the level of insignificance, surveys will be conducted prior to any vegetation removal or ground disturbing activities for the project (CM-VRN-01). If vernal pool fairy shrimp are observed, ESA fencing will be installed to avoid impacts to the pool (CM-VRN-03). In addition, ground disturbing activities will not occur within 250 feet of vernal pools or seasonal wetlands during the rainy season (CM-VRN-02). If vernal pool fairy shrimp individuals cannot be avoided, the Authority will reinitiate section 7 consultation to address unanticipated impacts to the species.

Without appropriate conservation measures, impacts could occur to vernal pool fairy shrimp outside of the project impact footprint but within 250 feet of project construction as a result of introduction of invasive species, habitat fragmentation, sedimentation, dust, pollution, increased access, human encroachment, and light spill associated with project construction, operation, and maintenance. However, the project has incorporated measures to avoid and minimize impacts to vernal pool fairy shrimp (Table 3). These measures are anticipated to minimize these potential impacts on vernal pool fairy shrimp in adjacent habitat to the point where such effects are insignificant.

Table 3. Measures to avoid or minimize adverse effects to vernal pool fairy shrimp

Effects of the Action	Conservation Measures
Introduction of invasive species, resulting in increased competition	CM-GEN-01: Establish Qualified Biologists and Biological Monitors

Habitat fragmentation resulting in loss of connectivity between populations Sedimentation, dust, pollution resulting in habitat degradation Increased access and human encroachment resulting in trampling, increased risk of wildfire Light spill resulting in physiological effects	CM-GEN-02: Conduct Monitoring of Construction Activities CM-GEN-03: Prepare and Implement a Weed Control Plan CM-GEN-05: Prepare and Implement a Construction Stormwater Pollution Prevention Plan CM-GEN-06: Prepare and Implement a Spill Prevention Plan CM-GEN-07: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training CM-GEN-08: Conduct Operation and Maintenance Period WEAP CM-GEN-11: Delineate Equipment Staging Areas and Traffic Routes CM-GEN-12: Stockpile and Redistribute Excavated Soil CM-GEN-13: Dispose of Construction Spoils and Waste CM-GEN-14: Clean Construction Equipment CM-GEN-15: Establish Environmentally Sensitive Areas and Non-Disturbance Zones CM-GEN-18: Establish Wildlife Crossings CM-GEN-19: Work Stoppage CM-GEN-21: Implement Avoidance of Nighttime Light Disturbance CM-GEN-22: Implement Water or Dust Palliative Measures CM-VRN-01: Conduct Pre-construction Surveys for Vernal Pool Wildlife Species CM-VRN-02: Implement Seasonal Vernal Pool Work Restriction CM-VRN-03: Implement and Monitor Vernal Pool Avoidance and Minimization Measures within Temporary Impact Areas

California Red-legged Frog

California Red-legged frog surveys were conducted for the project in portions of the action area, including Una Lake and the Santa Clara River, in 2017 (Authority 2017). In addition, the CNDDB has records for the species west of the action area in the vicinity of San Francisquito Creek and Amargosa Creek, and east of the action area in the vicinity of Aliso Canyon Creek. Modeled habitat for California red-legged frog is distributed throughout the project area as shown in Figure 15.

To ensure that impacts to California red-legged frog are reduced to the level of insignificance, surveys will be conducted prior to any vegetation removal or ground disturbing activities for the

project (CM-CRLF/MYLF-01). If California red-legged frog individuals cannot be avoided, the Authority will reinitiate section 7 consultation to address unanticipated impacts to the species.

Without appropriate conservation measures, impacts could occur to California red-legged frogs outside of the project impact footprint but within 1,000 feet of project construction as a result of introduction of invasive species, habitat fragmentation, sedimentation, dust, pollution, water diversions, increased access, human encroachment, light spill, and noise and vibrations associated with project construction, operation, and maintenance. However, the project has incorporated measures to avoid and minimize impacts to California red-legged frogs (Table 4). These measures are anticipated to minimize these potential impacts on California red-legged frogs in adjacent habitat to the point where such effects are insignificant.

Table 4. Measures to avoid or minimize adverse effects to California red-legged frog

Effects of the Action	Conservation Measures
Introduction of invasive species, resulting in increased competition Habitat fragmentation resulting in loss of connectivity between populations Sedimentation, dust, pollution and water diversions resulting in habitat degradation Increased access and human encroachment resulting in trampling, increased risk of wildfire, construction disturbance, entrapment Light spill resulting in physiological effects Noise and vibrations resulting in masking intraspecific communication, startling, behavioral effects	CM-GEN-01: Establish Qualified Biologists and Biological Monitors CM-GEN-02: Conduct Monitoring of Construction Activities CM-GEN-03: Prepare and Implement a Weed Control Plan CM-GEN-04: Prepare Plan for Dewatering and Water Diversions CM-GEN-05: Prepare and Implement a Construction Stormwater Pollution Prevention Plan CM-GEN-06: Prepare and Implement a Spill Prevention Plan CM-GEN-07: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training CM-GEN-08: Conduct Operation and Maintenance Period WEAP CM-GEN-09: Establish Monofilament Restrictions CM-GEN-10: Avoid Animal Entrapment CM-GEN-11: Delineate Equipment Staging Areas and Traffic Routes CM-GEN-12: Stockpile and Redistribute Excavated Soil CM-GEN-13: Dispose of Construction Spoils and Waste CM-GEN-14: Clean Construction Equipment CM-GEN-15: Establish Environmentally Sensitive Areas and Non-Disturbance Zones CM-GEN-16: Install Aprons or Barriers within Security Fencing CM-GEN-17: Minimize Effects to Wildlife Movement Corridors during Construction CM-GEN-18: Establish Wildlife Crossings CM-GEN-19: Work Stoppage

	CM-GEN-20: Enforce Construction Speed Limit CM-GEN-21: Implement Avoidance of Nighttime Light Disturbance CM-GEN-22: Implement Water or Dust Palliative Measures CM-GEN-24: Tunnel Construction Methods and Approaches within the Angeles National Forest Involving Tunnel Boring Machines, Tunnel Lining Systems, and Tunnel Grouting to Avoid and Minimize Changes in Groundwater Levels as a Result of Tunnel Construction CM-GEN-25: Implement the Water Resources Adaptive Management and Monitoring Plan CM-CRLF/MYLF-01: Conduct Pre-construction Surveys for Special-Status Amphibian Species

Desert Tortoise

Desert tortoise surveys were not conducted for the project. There are no records for desert tortoises within 10 miles of the action area, but the northern portion of the action area is within the historic range of the species. The CNDDB has records for the species in Antelope Valley to the northeast and northwest of the action area in areas where the habitat has not been altered to agriculture and other development. Modeled habitat for desert tortoise is distributed throughout the project area as shown in Figure 16.

To ensure that impacts to desert tortoise are reduced to the level of insignificance, surveys will be conducted prior to any vegetation removal or ground disturbing activities for the project (CM-DT-01). If desert tortoises are observed, the biological monitor will implement measures to avoid impacts to the species (CM-DT-02, CM-DT-03, CM-DT-04, CM-DT-05, CM-DT-06, CM-DT-07). If desert tortoise individuals cannot be avoided, the Authority will reinitiate section 7 consultation to address unanticipated impacts to the species.

Without appropriate conservation measures, impacts could occur to desert tortoise outside of the project impact footprint but within 1,000 feet of project construction as a result of introduction of invasive species, habitat fragmentation, sedimentation, dust, pollution, increased access, human encroachment, light spill, and noise and vibrations associated with project construction, operation, and maintenance. However, the project has incorporated measures to avoid and minimize impacts to desert tortoise (Table 5). These measures are anticipated to minimize these potential impacts on desert tortoise in adjacent habitat to the point where such effects are insignificant.

Table 5. Measures to avoid or minimize adverse effects to desert tortoise

Effects of the Action	Conservation Measures
Introduction of invasive species, resulting in increased competition Habitat fragmentation resulting in loss of connectivity between populations Sedimentation, dust, and pollution resulting in habitat degradation Increased access and human encroachment resulting in increased risk of wildfire, construction disturbance, entrapment Light spill resulting in physiological effects Noise and vibrations resulting in behavioral effects	CM-GEN-01: Establish Qualified Biologists and Biological Monitors CM-GEN-02: Conduct Monitoring of Construction Activities CM-GEN-03: Prepare and Implement a Weed Control Plan CM-GEN-05: Prepare and Implement a Construction Stormwater Pollution Prevention Plan CM-GEN-06: Prepare and Implement a Spill Prevention Plan CM-GEN-07: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training CM-GEN-08: Conduct Operation and Maintenance Period WEAP CM-GEN-09: Establish Monofilament Restrictions CM-GEN-10: Avoid Animal Entrapment CM-GEN-11: Delineate Equipment Staging Areas and Traffic Routes CM-GEN-12: Stockpile and Redistribute Excavated Soil CM-GEN-13: Dispose of Construction Spoils and Waste CM-GEN-14: Clean Construction Equipment CM-GEN-15: Establish Environmentally Sensitive Areas and Non-Disturbance Zones CM-GEN-16: Install Aprons or Barriers within Security Fencing CM-GEN-17: Minimize Effects to Wildlife Movement Corridors during Construction CM-GEN-18: Establish Wildlife Crossings CM-GEN-19: Work Stoppage CM-GEN-20: Enforce Construction Speed Limit CM-GEN-21: Implement Avoidance of Nighttime Light Disturbance CM-GEN-22: Implement Water or Dust Palliative Measures CM-DT-01: Conduct Pre-construction Surveys for Desert Tortoise CM-DT-02: Implement Avoidance Measures for Desert Tortoise CM-DT-03: Implement Avoidance Measures for Desert Tortoise Burrows CM-DT-04: Inspect Structures that Provide Potential Shelter for Desert Tortoise

	CM-DT-05: Inspect under Vehicles in Desert Tortoise Habitat CM-DT-06: Installation of Desert Tortoise Guards CM-DT-07: Implement Common Raven Avoidance Measures in Desert Tortoise Habitat

Yellow-billed Cuckoo

Yellow-billed cuckoo surveys were not conducted for the project. CNDDB includes a historic record for the species in the vicinity of San Fernando near the southern end of the action area. A 2018 record is reported by eBird from the Santa Clara River in Santa Clarita approximately 8 miles west of the action area (Authority 2023). Modeled habitat for yellow-billed cuckoo is distributed throughout the project area as shown in Figure 17.

To ensure that impacts to yellow-billed cuckoo are reduced to the level of insignificance, surveys will be conducted prior to any vegetation removal or ground disturbing activities for the project (CM-YBCU-01). If yellow-billed cuckoo individuals cannot be avoided, the Authority will reinitiate section 7 consultation to address unanticipated impacts to the species.

Without appropriate conservation measures, impacts could occur to yellow-billed cuckoos outside of the project impact footprint but within 1,000 feet of project construction as a result of introduction of invasive species, habitat fragmentation, sedimentation, dust, pollution, water diversions, increased access, human encroachment, light spill, and noise and vibrations associated with project construction, operation, and maintenance. However, the project has incorporated measures to avoid and minimize impacts to yellow-billed cuckoo (Table 6). These measures are anticipated to minimize these potential impacts on yellow-billed cuckoo in adjacent habitat to the point where such effects are insignificant.

Table 6. Measures to avoid or minimize adverse effects to yellow-billed cuckoo

Effects of the Action	Conservation Measures
Introduction of invasive species, resulting in increased competition Habitat fragmentation resulting in loss of connectivity between populations Sedimentation, dust, pollution and water diversions resulting in habitat degradation Increased access and human encroachment resulting in	CM-GEN-01: Establish Qualified Biologists and Biological Monitors CM-GEN-02: Conduct Monitoring of Construction Activities CM-GEN-03: Prepare and Implement a Weed Control Plan CM-GEN-04: Prepare Plan for Dewatering and Water Diversions CM-GEN-05: Prepare and Implement a Construction Stormwater Pollution Prevention Plan CM-GEN-06: Prepare and Implement a Spill Prevention Plan CM-GEN-07: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training

increased risk of wildfire, construction disturbance Light spill resulting in physiological effects Noise and vibrations resulting in masking intraspecific communication, startling, behavioral effects	CM-GEN-08: Conduct Operation and Maintenance Period WEAP CM-GEN-09: Establish Monofilament Restrictions CM-GEN-10: Avoid Animal Entrapment CM-GEN-11: Delineate Equipment Staging Areas and Traffic Routes CM-GEN-12: Stockpile and Redistribute Excavated Soil CM-GEN-13: Dispose of Construction Spoils and Waste CM-GEN-14: Clean Construction Equipment CM-GEN-15: Establish Environmentally Sensitive Areas and Non-Disturbance Zones CM-GEN-16: Install Aprons or Barriers within Security Fencing CM-GEN-17: Minimize Effects to Wildlife Movement Corridors during Construction CM-GEN-18: Establish Wildlife Crossings CM-GEN-19: Work Stoppage CM-GEN-20: Enforce Construction Speed Limit CM-GEN-21: Implement Avoidance of Nighttime Light Disturbance CM-GEN-22: Implement Water or Dust Palliative Measures CM-GEN-24: Tunnel Construction Methods and Approaches within the Angeles National Forest Involving Tunnel Boring Machines, Tunnel Lining Systems, and Tunnel Grouting to Avoid and Minimize Changes in Groundwater Levels as a Result of Tunnel Construction CM-GEN-25: Implement the Water Resources Adaptive Management and Monitoring Plan CM-YBCU-01: Conduct Pre-construction Surveys and Implement Impact Avoidance for Yellow-billed Cuckoo

Braunton's Milk-vetch

Braunton's milk-vetch surveys were not conducted for the project, but the CNDDB has records for the species to the South, Southwest, and East of the action area in the Santa Monica Mountains, Simi Hills, and San Gabriel Mountains. The Forest also has records for the species in the Angeles National Forest that are not in the CNDDB, but these occurrences are outside of the action area (Authority 2023). Braunton's milk-vetch modeled habitat is distributed throughout the project area as shown in Figure 18.

To ensure that impacts to Braunton's milk-vetch are reduced to the level of insignificance, surveys will be conducted prior to any vegetation removal or ground disturbing activities for the

project (CM-PLT-01). If Braunton's milk-vetch individuals cannot be avoided, the Authority will reinitiate section 7 consultation to address unanticipated impacts to the species.

Without appropriate conservation measures, impacts could occur to Braunton's milk-vetch outside of the project impact footprint but within 100 feet of project construction as a result of introduction of invasive species, habitat fragmentation, sedimentation, dust, pollution, increased access, human encroachment, and light spill associated with project construction, operation, and maintenance. However, the project has incorporated measures to avoid and minimize impacts to Braunton's milk-vetch (Table 7). These measures are anticipated to minimize these potential impacts on Braunton's milk-vetch in adjacent habitat to the point where such effects are insignificant.

Table 7. Measures to avoid or minimize adverse effects to Braunton's milk-vetch

Effects of the Action	Conservation Measures
Introduction of invasive species, resulting in increased competition Habitat fragmentation resulting in loss of connectivity between populations Sedimentation, dust, pollution resulting in habitat degradation Increased access and human encroachment resulting in trampling, increased risk of wildfire Light spill resulting in physiological effects	CM-GEN-01: Establish Qualified Biologists and Biological Monitors CM-GEN-02: Conduct Monitoring of Construction Activities CM-GEN-03: Prepare and Implement a Weed Control Plan CM-GEN-05: Prepare and Implement a Construction Stormwater Pollution Prevention Plan CM-GEN-06: Prepare and Implement a Spill Prevention Plan CM-GEN-07: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training CM-GEN-08: Conduct Operation and Maintenance Period WEAP CM-GEN-11: Delineate Equipment Staging Areas and Traffic Routes CM-GEN-12: Stockpile and Redistribute Excavated Soil CM-GEN-13: Dispose of Construction Spoils and Waste CM-GEN-14: Clean Construction Equipment CM-GEN-15: Establish Environmentally Sensitive Areas and Non-Disturbance Zones CM-GEN-18: Establish Wildlife Crossings CM-GEN-19: Work Stoppage CM-GEN-21: Implement Avoidance of Nighttime Light Disturbance CM-GEN-22: Implement Water or Dust Palliative Measures CM-PLT-01: Conduct Presence/ Absence Pre-construction Surveys for Listed Plants

Nevin's Barberry

Limited Nevin's barberry surveys were conducted for the project in a 4-acre area around a known individual in Lopez Canyon in 2017. The known individual was the only Nevin's barberry plant observed (Circlepoint 2017). In addition, the CNDDB has records for the species to the South, West, and East of the action area in Griffith Park, Pasadena, San Francisquito Canyon, and the San Gabriel Mountains. Nevin's barberry modeled habitat is distributed throughout the project area as shown in Figure 19.

To ensure that impacts to Nevin's barberry are reduced to the level of insignificance, surveys will be conducted prior to any vegetation removal or ground disturbing activities for the project (CM-PLT-01). If Nevin's barberry individuals cannot be avoided, the Authority will reinitiate section 7 consultation to address unanticipated impacts to the species.

Without appropriate conservation measures, impacts could occur to Nevin's barberry outside of the project impact footprint but within 100 feet of project construction as a result of introduction of invasive species, habitat fragmentation, sedimentation, dust, pollution, increased access, human encroachment, and light spill associated with project construction, operation, and maintenance. However, the project has incorporated measures to avoid and minimize impacts to Nevin's barberry (Table 8). These measures are anticipated to minimize these potential impacts on Nevin's barberry in adjacent habitat to the point where such effects are insignificant.

Table 8. Measures to avoid or minimize adverse effects to Nevin's Barberry

Effects of the Action	Conservation Measures
Introduction of invasive species, resulting in increased competition Habitat fragmentation resulting in loss of connectivity between populations Sedimentation, dust, pollution resulting in habitat degradation Increased access and human encroachment resulting in trampling, increased risk of wildfire Light spill resulting in physiological effects	CM-GEN-01: Establish Qualified Biologists and Biological Monitors CM-GEN-02: Conduct Monitoring of Construction Activities CM-GEN-03: Prepare and Implement a Weed Control Plan CM-GEN-05: Prepare and Implement a Construction Stormwater Pollution Prevention Plan CM-GEN-06: Prepare and Implement a Spill Prevention Plan CM-GEN-07: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training CM-GEN-08: Conduct Operation and Maintenance Period WEAP CM-GEN-11: Delineate Equipment Staging Areas and Traffic Routes CM-GEN-12: Stockpile and Redistribute Excavated Soil CM-GEN-13: Dispose of Construction Spoils and Waste CM-GEN-14: Clean Construction Equipment CM-GEN-15: Establish Environmentally Sensitive Areas and Non-Disturbance Zones

	CM-GEN-18: Establish Wildlife Crossings CM-GEN-19: Work Stoppage CM-GEN-21: Implement Avoidance of Nighttime Light Disturbance CM-GEN-22: Implement Water or Dust Palliative Measures CM-PLT-01: Conduct Presence/ Absence Pre-construction Surveys for Listed Plants

Spreading Navarretia

Spreading navarretia surveys were not conducted for the project, but a vernal pool assessment was conducted for the project in the winter of 2017. In addition, the CNDDB has records for the species west of the action area in the vicinity of Santa Clarita. Potential habitat for spreading navarretia is distributed throughout the project area as shown in Figure 20.

To ensure that impacts to spreading navarretia are reduced to the level of insignificance, surveys will be conducted prior to any vegetation removal or ground disturbing activities for the project (CM-PLT-01). In addition, ground disturbing activities will not occur within 250 feet of vernal pools or seasonal wetlands during the rainy season (CM-VRN-02). If spreading navarretia individuals cannot be avoided, the Authority will reinitiate section 7 consultation to address unanticipated impacts to the species.

Without appropriate conservation measures, potential impacts could occur to spreading navarretia outside of the project impact footprint but within 100 feet of project construction as a result of introduction of invasive species, habitat fragmentation, sedimentation, dust, pollution, increased access, human encroachment, and light spill associated with project construction, operation, and maintenance. However, the project has incorporated measures to avoid and minimize impacts to spreading navarretia (Table 9). These measures are anticipated to minimize these potential impacts on spreading navarretia in adjacent habitat to the point where such effects are insignificant.

Table 9. Measures to avoid or minimize adverse effects to spreading navarretia

Effects of the Action	Conservation Measures
Introduction of invasive species, resulting in increased competition Habitat fragmentation resulting in loss of connectivity between populations Sedimentation, dust, pollution resulting in habitat degradation	CM-GEN-01: Establish Qualified Biologists and Biological Monitors CM-GEN-02: Conduct Monitoring of Construction Activities CM-GEN-03: Prepare and Implement a Weed Control Plan CM-GEN-05: Prepare and Implement a Construction Stormwater Pollution Prevention Plan CM-GEN-06: Prepare and Implement a Spill Prevention Plan

Increased access and human encroachment resulting in trampling, increased risk of wildfire Light spill resulting in physiological effects	CM-GEN-07: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training CM-GEN-08: Conduct Operation and Maintenance Period WEAP CM-GEN-11: Delineate Equipment Staging Areas and Traffic Routes CM-GEN-12: Stockpile and Redistribute Excavated Soil CM-GEN-13: Dispose of Construction Spoils and Waste CM-GEN-14: Clean Construction Equipment CM-GEN-15: Establish Environmentally Sensitive Areas and Non-Disturbance Zones CM-GEN-18: Establish Wildlife Crossings CM-GEN-19: Work Stoppage CM-GEN-21: Implement Avoidance of Nighttime Light Disturbance CM-GEN-22: Implement Water or Dust Palliative Measures CM-PLT-01: Conduct Presence/ Absence Pre-construction Surveys for Listed Plants CM-VRN-02: Implement Seasonal Vernal Pool Work Restriction

California Orcutt Grass

California Orcutt grass surveys were not conducted for the project, but a vernal pool assessment was conducted for the project in the winter of 2017. In addition, the CNDDB has records for the species west of the action area in the vicinity of Santa Clarita. Potential habitat for California Orcutt grass is distributed throughout the project area as shown in Figure 21.

To ensure that impacts to California Orcutt grass are reduced to the level of insignificance, surveys will be conducted prior to any vegetation removal or ground disturbing activities for the project (CM-PLT-01). In addition, ground disturbing activities will not occur within 250 feet of vernal pools or seasonal wetlands during the rainy season (CM-VRN-02). If California Orcutt grass individuals cannot be avoided, the Authority will reinitiate section 7 consultation to address unanticipated impacts to the species.

Without appropriate conservation measures, impacts could occur to California Orcutt grass outside of the project impact footprint but within 100 feet of project construction as a result of introduction of invasive species, habitat fragmentation, sedimentation, dust, pollution, increased access, human encroachment, and light spill associated with project construction, operation, and maintenance. However, the project has incorporated measures to avoid and minimize impacts to California Orcutt grass (Table 10). These measures are anticipated to minimize these potential impacts on California Orcutt grass in adjacent habitat to the point where such effects are insignificant.

Table 10. Measures to avoid or minimize adverse effects to California Orcutt grass

Effects of the Action	Conservation Measures
Introduction of invasive species, resulting in increased competition Habitat fragmentation resulting in loss of connectivity between populations Sedimentation, dust, pollution resulting in habitat degradation Increased access and human encroachment resulting in trampling, increased risk of wildfire Light spill resulting in physiological effects	CM-GEN-01: Establish Qualified Biologists and Biological Monitors CM-GEN-02: Conduct Monitoring of Construction Activities CM-GEN-03: Prepare and Implement a Weed Control Plan CM-GEN-05: Prepare and Implement a Construction Stormwater Pollution Prevention Plan CM-GEN-06: Prepare and Implement a Spill Prevention Plan CM-GEN-07: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training CM-GEN-08: Conduct Operation and Maintenance Period WEAP CM-GEN-11: Delineate Equipment Staging Areas and Traffic Routes CM-GEN-12: Stockpile and Redistribute Excavated Soil CM-GEN-13: Dispose of Construction Spoils and Waste CM-GEN-14: Clean Construction Equipment CM-GEN-15: Establish Environmentally Sensitive Areas and Non-Disturbance Zones CM-GEN-18: Establish Wildlife Crossings CM-GEN-19: Work Stoppage CM-GEN-21: Implement Avoidance of Nighttime Light Disturbance CM-GEN-22: Implement Water or Dust Palliative Measures CM-PLT-01: Conduct Presence/ Absence Pre-construction Surveys for Listed Plants CM-VRN-02: Implement Seasonal Vernal Pool Work Restriction

Unarmored Threespine Stickleback

A habitat assessment was conducted for unarmored threespine stickleback for the project in 2016 (Authority 2016). Unarmored threespine stickleback surveys were not conducted for the project. The CNDDB has a historic record for the species in the action area at Agua Dulce; however, the species was last seen at this location in 1996, and the habitat has changed from perennial stream to desert wash and is no longer considered to be suitable for the species. The CNDDB also has a current record for the species in the action area at the Santa Clara River. Modeled habitat for unarmored threespine stickleback is distributed throughout the project area as shown in Figure

22. Construction of the viaduct structure over the occupied habitat in the Santa Clara River is anticipated to last three and a half years.

To ensure that impacts to unarmored threespine stickleback are reduced to the level of insignificance, measures will be implemented to avoid impacts to the species (CM-UTS-01, CM-UTS-02, CM-UTS-03, CM-UTS-04, CM-UTS-05, CM-UTS-06, CM-UTS-07, CM-UTS-08, CM-UTS-09). The project will limit the construction, operations, and maintenance footprint in the low-flow channel and when water is present. Permanent support structures (bridge piers) will be installed outside of the 25-year flood limit using a no water contact approach to avoid impacts to the species, and work within the active channel will take place when the riverbed is dry. Temporary support structures may be installed inside the 25-year flood limit during the dry season but will be removed at the end of the dry season. The viaduct has been designed to limit shading, with a near perpendicular profile for the alignment crossing, a height of 100 feet above the channel, and a split rail deck design. Bridge pilings will be designed to limit scour depressions to avoid stranding unarmored threespine stickleback. Measures have been incorporated into the project to address pumping and discharge of groundwater during project construction to avoid impacts to unarmored threespine stickleback from dewatering and wastewater discharge. A tarp or similar catchment will be deployed beneath the bridge deck during construction to prevent construction materials from dropping into the river channel during construction. In addition, tunnels for the facility will be designed and constructed in a manner that minimizes impacts to groundwater, seeps, and springs.

Operations and maintenance activities may involve the use of pesticides, herbicides, or soil binders that have the potential to affect water quality. Measures have been incorporated into the project to ensure that maintenance workers are properly trained to avoid discharge of contaminants into aquatic habitats occupied by unarmored threespine stickleback.

Without appropriate conservation measures, impacts could occur to unarmored threespine stickleback outside of the project impact footprint but within 1,000 feet of project construction as a result of introduction of invasive species, habitat fragmentation, sedimentation, dust, pollution, water diversions, increased access, and human encroachment associated with project construction, operation, and maintenance. However, the project has incorporated measures to avoid and minimize these impacts to unarmored threespine stickleback (Table 11). These measures are anticipated to minimize these potential impacts on unarmored threespine stickleback in adjacent habitat to the point where such effects are insignificant.

Table 11. Measures to avoid or minimize adverse effects to unarmored threespine stickleback

Effects of the Action	Conservation Measures
Introduction of invasive species, resulting in increased competition	CM-GEN-01: Establish Qualified Biologists and Biological Monitors CM-GEN-02: Conduct Monitoring of Construction Activities CM-GEN-03: Prepare and Implement a Weed Control Plan

Habitat fragmentation resulting in loss of connectivity between populations Sedimentation, dust, pollution and water diversions resulting in habitat degradation Increased access and human encroachment resulting in trampling, increased risk of wildfire Installation of structures resulting in direct impacts to the species habitat Shading from the viaduct resulting in habitat degradation Scour around bridge pilings resulting in scour depressions and entrapment Disposal of groundwater during construction resulting in groundwater effects, temporary non-seasonal flows Tunnel construction resulting in groundwater impacts Maintenance activities resulting in pollution, sedimentation, and human encroachment	CM-GEN-04: Prepare Plan for Dewatering and Water Diversions CM-GEN-05: Prepare and Implement a Construction Stormwater Pollution Prevention Plan CM-GEN-06: Prepare and Implement a Spill Prevention Plan CM-GEN-07: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training CM-GEN-08: Conduct Operation and Maintenance Period WEAP CM-GEN-11: Delineate Equipment Staging Areas and Traffic Routes CM-GEN-12: Stockpile and Redistribute Excavated Soil CM-GEN-13: Dispose of Construction Spoils and Waste CM-GEN-14: Clean Construction Equipment CM-GEN-15: Establish Environmentally Sensitive Areas and Non-Disturbance Zones CM-GEN-17: Minimize Effects to Wildlife Movement Corridors during Construction CM-GEN-18: Establish Wildlife Crossings CM-GEN-19: Work Stoppage CM-GEN-20: Enforce Construction Speed Limit CM-GEN-22: Implement Water or Dust Palliative Measures CM-GEN-24: Tunnel Construction Methods and Approaches within the Angeles National Forest Involving Tunnel Boring Machines, Tunnel Lining Systems, and Tunnel Grouting to Avoid and Minimize Changes in Groundwater Levels as a Result of Tunnel Construction CM-GEN-25: Implement the Water Resources Adaptive Management and Monitoring Plan CM-UTS-01: Implement Worker Environmental Awareness Program for Unarmored Threespine Stickleback CM-UTS-02: Establish Construction Zones and Environmentally Sensitive Areas CM-UTS-03: Santa Clara River Construction and Maintenance Activity Weather Related and Seasonal Work Restrictions CM-UTS-04: Prepare and Implement Spill Prevention and Containment Measures CM-UTS-05: Implement Construction or Maintenance Activity Debris Prevention Measures

	CM-UTS-06: Implement Construction Measures for Unarmored Threespine Stickleback Avoidance CM-UTS-07: Prepare a Construction Groundwater Dewatering Plan CM-UTS-08: Implement Scour Avoidance Features Around Bridge Piers CM-UTS-09: Implement Avoidance Measures During Operations and Maintenance for the Santa Clara River

Mountain Yellow-legged Frog

Mountain yellow-legged frog surveys were not conducted for the project. The CNDDB has historic records for the species near the action area at Pacoima wash and Tujunga wash, and current records for the species about 15 miles east of the action area in the vicinity of Little Rock Creek. Modeled habitat for Mountain yellow-legged frog is distributed throughout the project area as shown in Figure 23.

To ensure that impacts to Mountain yellow-legged frog are reduced to the level of insignificance, surveys will be conducted prior to any vegetation removal or ground disturbing activities for the project (CM-CRLF/MYLF-01). If Mountain yellow-legged frog individuals cannot be avoided, the Authority will reinitiate section 7 consultation to address unanticipated impacts to the species.

Without appropriate conservation measures, impacts may occur to Mountain yellow-legged frogs outside of the project impact footprint but within 1,000 feet of project construction as a result of introduction of invasive species, habitat fragmentation, sedimentation, dust, pollution, water diversions, increased access, human encroachment, light spill, and noise and vibrations associated with project construction, operation, and maintenance. However, the project has incorporated measures to avoid and minimize impacts to Mountain yellow-legged frogs (Table 12). These measures are anticipated to minimize these potential impacts on Mountain yellow-legged frogs in adjacent habitat to the point where such effects are insignificant.

Table 12. Measures to avoid or minimize adverse effects to mountain yellow-legged frog

Effects of the Action	Conservation Measures
Introduction of invasive species, resulting in increased competition Habitat fragmentation resulting in loss of connectivity between populations	CM-GEN-01: Establish Qualified Biologists and Biological Monitors CM-GEN-02: Conduct Monitoring of Construction Activities CM-GEN-03: Prepare and Implement a Weed Control Plan CM-GEN-04: Prepare Plan for Dewatering and Water Diversions CM-GEN-05: Prepare and Implement a Construction Stormwater Pollution Prevention Plan

Sedimentation, dust, pollution and water diversions resulting in habitat degradation Increased access and human encroachment resulting in trampling, increased risk of wildfire, construction disturbance, entrapment Light spill resulting in physiological effects Noise and vibrations resulting in masking intraspecific communication, startling, behavioral effects	CM-GEN-06: Prepare and Implement a Spill Prevention Plan CM-GEN-07: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training CM-GEN-08: Conduct Operation and Maintenance Period WEAP CM-GEN-09: Establish Monofilament Restrictions CM-GEN-10: Avoid Animal Entrapment CM-GEN-11: Delineate Equipment Staging Areas and Traffic Routes CM-GEN-12: Stockpile and Redistribute Excavated Soil CM-GEN-13: Dispose of Construction Spoils and Waste CM-GEN-14: Clean Construction Equipment CM-GEN-15: Establish Environmentally Sensitive Areas and Non-Disturbance Zones CM-GEN-16: Install Aprons or Barriers within Security Fencing CM-GEN-17: Minimize Effects to Wildlife Movement Corridors during Construction CM-GEN-18: Establish Wildlife Crossings CM-GEN-19: Work Stoppage CM-GEN-20: Enforce Construction Speed Limit CM-GEN-21: Implement Avoidance of Nighttime Light Disturbance CM-GEN-22: Implement Water or Dust Palliative Measures CM-GEN-24: Tunnel Construction Methods and Approaches within the Angeles National Forest Involving Tunnel Boring Machines, Tunnel Lining Systems, and Tunnel Grouting to Avoid and Minimize Changes in Groundwater Levels as a Result of Tunnel Construction CM-GEN-25: Implement the Water Resources Adaptive Management and Monitoring Plan CM-CRLF/MYLF-01: Conduct Pre-construction Surveys for Special-Status Amphibian Species

California Condor

California condor surveys were not conducted for the project; however, the species is known to engage in periodic flights and roosting throughout the Angeles National Forest. California Condors have been observed periodically roosting on communication towers at Kagel Mountain, and at Contract Point, Loop Canyon, and nearby areas along Forest Road 3N17.8 between the

Forest Service Bear Divide Station and County Camp 9 in proximity to the action area. Modeled habitat for California condor is distributed throughout the project area as shown in Figure 24.

To ensure that impacts to California condor are reduced to the level of insignificance, the Biological Monitor will coordinate with the Service to review California condor tracking locations at least seven days prior to any vegetation removal or ground disturbing activities for the project (CM-CACO-01). The Biological Monitor will be present during construction within two miles of where California condors have been observed, based on the most recent tracking data and locations obtained from coordination with the Service (CM-CACO-02). If California condors are observed within half a mile of project work, the biological monitor will implement measures, such as establishing work timing restrictions, proper storage of hazardous construction materials, helicopter avoidance, and work stoppages to avoid impacts to the species (CM-CACO-03, CM-CACO-04, CM-CACO-05, CM-CACO-06). If California condor individuals cannot be avoided, the Authority will reinitiate section 7 consultation to address unanticipated impacts to the species.

High Speed Rail operations and maintenance has the potential to affect California condors by causing wildlife mortality that attracts condors into the project area where they may be struck by trains. Measures have been incorporated into the project to ensure that these impacts are avoided. Dead and injured wildlife found in the right-of-way and tracks will be removed when the train is not in operation. Automated security monitoring and track inspections will be used to detect fence failures and/or the presence of carrion in the right-of way (CM-CACO-07).

Without appropriate conservation measures, impacts could occur to California condor outside of the project impact footprint but within 1,000 feet of project construction as a result of introduction of invasive species, habitat fragmentation, sedimentation, dust, pollution, increased access, human encroachment, light spill, and noise and vibrations associated with project construction, operation, and maintenance. However, the project has incorporated measures to avoid and minimize impacts to California condor (Table 13). These measures are anticipated to minimize these potential impacts on California condor in adjacent habitat to the point where such effects are insignificant.

Table 13. Measures to avoid or minimize adverse effects to California condor

Effects of the Action	Conservation Measures
Introduction of invasive species, resulting in increased competition Habitat fragmentation resulting in loss of connectivity between populations	CM-GEN-01: Establish Qualified Biologists and Biological Monitors CM-GEN-02: Conduct Monitoring of Construction Activities CM-GEN-03: Prepare and Implement a Weed Control Plan CM-GEN-05: Prepare and Implement a Construction Stormwater Pollution Prevention Plan CM-GEN-06: Prepare and Implement a Spill Prevention Plan

Sedimentation, dust, and pollution resulting in habitat degradation Increased access and human encroachment resulting in increased risk of wildfire, construction disturbance Light spill resulting in physiological effects Noise and vibrations resulting in masking intraspecific communication, startling, behavioral effects	CM-GEN-07: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training CM-GEN-08: Conduct Operation and Maintenance Period WEAP CM-GEN-09: Establish Monofilament Restrictions CM-GEN-10: Avoid Animal Entrapment CM-GEN-11: Delineate Equipment Staging Areas and Traffic Routes CM-GEN-12: Stockpile and Redistribute Excavated Soil CM-GEN-13: Dispose of Construction Spoils and Waste CM-GEN-14: Clean Construction Equipment CM-GEN-15: Establish Environmentally Sensitive Areas and Non-Disturbance Zones CM-GEN-16: Install Aprons or Barriers within Security Fencing CM-GEN-17: Minimize Effects to Wildlife Movement Corridors during Construction CM-GEN-18: Establish Wildlife Crossings CM-GEN-19: Work Stoppage CM-GEN-20: Enforce Construction Speed Limit CM-GEN-21: Implement Avoidance of Nighttime Light Disturbance CM-GEN-22: Implement Water or Dust Palliative Measures CM-CACO-01: Coordinate with USFWS[4] on California Condor Locations CM-CACO-02: Monitor for California Condor CM-CACO-03: Work Timing Restrictions Near California Condor Roosting Locations CM-CACO-04: Implement Avoidance Measures for California Condor CM-CACO-05: Implement Helicopter Avoidance Measures for California Condor CM-CACO-06: Stop Work and Implement Hazing Methods for California Condor CM-CACO-07: Implement Removal of Carrion that may Attract California Condor

California Spotted Owl

California spotted owl surveys were not conducted for the project. CNDDB includes numerous records for the species in the Angeles National Forest, including 7 records in the vicinity of Los

[4] U.S. Fish and Wildlife Service is abbreviated as USFWS in the conservation measures.

Pinetos Canyon, about 3 miles northwest of the Pacoima Adit, and 4 records in the vicinity of upper Pacoima Canyon, about 6 miles east of the Santa Clara viaduct. Modeled habitat for California spotted owl is distributed throughout the project area as shown in Figure 25.

To ensure that impacts to California spotted owl are reduced to the level of insignificance, surveys will be conducted prior to any vegetation removal or ground disturbing activities for the project (CM-OWL-01). If California spotted owls are observed, the biological monitor will implement measures, such as establishing work timing restrictions to avoid impacts to the species (CM-Owl-02). If California spotted owl individuals cannot be avoided, the Authority will reinitiate section 7 consultation to address unanticipated impacts to the species.

Without appropriate conservation measures, impacts could occur to California spotted owl outside of the project impact footprint but within 1,000 feet of project construction as a result of introduction of invasive species, habitat fragmentation, sedimentation, dust, pollution, increased access, human encroachment, light spill, and noise and vibrations associated with project construction, operation, and maintenance. However, the project has incorporated measures to avoid and minimize impacts to California spotted owl (Table 14). These measures are anticipated to minimize these potential impacts on California spotted owl in adjacent habitat to the point where such effects are insignificant.

Table 14. Measures to avoid or minimize adverse effects to California spotted owl

Effects of the Action	Conservation Measures
Introduction of invasive species, resulting in increased competition Habitat fragmentation resulting in loss of connectivity between populations Sedimentation, dust, and pollution resulting in habitat degradation Increased access and human encroachment resulting in increased risk of wildfire, construction disturbance Light spill resulting in physiological effects Noise and vibrations resulting in masking intraspecific	CM-GEN-01: Establish Qualified Biologists and Biological Monitors CM-GEN-02: Conduct Monitoring of Construction Activities CM-GEN-03: Prepare and Implement a Weed Control Plan CM-GEN-05: Prepare and Implement a Construction Stormwater Pollution Prevention Plan CM-GEN-06: Prepare and Implement a Spill Prevention Plan CM-GEN-07: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training CM-GEN-08: Conduct Operation and Maintenance Period WEAP CM-GEN-09: Establish Monofilament Restrictions CM-GEN-10: Avoid Animal Entrapment CM-GEN-11: Delineate Equipment Staging Areas and Traffic Routes CM-GEN-12: Stockpile and Redistribute Excavated Soil CM-GEN-13: Dispose of Construction Spoils and Waste CM-GEN-14: Clean Construction Equipment CM-GEN-15: Establish Environmentally Sensitive Areas and Non-Disturbance Zones

communication, startling, behavioral effects	CM-GEN-16: Install Aprons or Barriers within Security Fencing CM-GEN-17: Minimize Effects to Wildlife Movement Corridors during Construction CM-GEN-18: Establish Wildlife Crossings CM-GEN-19: Work Stoppage CM-GEN-20: Enforce Construction Speed Limit CM-GEN-21: Implement Avoidance of Nighttime Light Disturbance CM-GEN-22: Implement Water or Dust Palliative Measures CM-OWL-01: Conduct Pre-construction Surveys for California Spotted Owl CM-OWL-02: Work Timing Restrictions Near California Spotted Owl Occupied Site

Conclusion

As analyzed above, with incorporation of conservation measures (Appendix 3), potential impacts to vernal pool fairy shrimp, California red-legged frog, desert tortoise, and yellow-billed cuckoo, Braunton's milk-vetch, Nevin's barberry, spreading navarretia, California Orcutt grass, unarmored threespine stickleback, mountain yellow-legged frog, California condor, and California spotted owl, will be minimized to the point where such effects are insignificant. Based on the site and species information and the Authority's commitment to implement avoidance and minimization measures during the project, we concur with the Authority's determination that the project is not likely to adversely affect these listed species.

LITERATURE CITED (APPENDIX 2)

[Authority] California High Speed Rail Authority. 2016. Palmdale to Burbank Project Section: Preliminary Habitat Assessment for Unarmored Threespine Stickleback at Four Proposed High Speed Rail Crossing Locations. 9 pp.

[Authority] California High Speed Rail Authority. 2017. Palmdale to Burbank Project Section: California Red-legged Frog Habitat Assessment and Protocol Survey Report.

[Authority] California High Speed Rail Authority. 2023. Palmdale to Burbank Project Section Biological Assessment. November 2023. 194 pp + Appendices.

Circlepoint. 2017. Summary of Findings for a Nevin's Barberry Floristic Pedestrian Survey, March 2017 - California High-Speed Rail Palmdale to Burbank Project Section EEPB-CIR-TK05-RE-0043_Rev01. 9 pp.

APPENDIX 2

Modeled Habitat Categories and Descriptions for Species Addressed in this Biological Opinion

Species and Modeled Habitat Categories	Description of Modeled Suitable Habitat Categories
Slender-Horned Spineflower (*Dodecahema leptoceras*)	
Potentially Suitable Habitat	Potentially suitable habitat includes all natural extant occurrences and the other areas where the species may occur. The model results for potentially suitable habitat are based on the species habitat associations with suitable categories of vegetation, known elevation range, and documented species range within the study area. *Vegetation*: Suitable vegetation types are scrub types, including the following WHR types: Barren, Chamise-Redshank Chaparral, Mixed Chaparral, Coastal Scrub, Desert Riparian, Desert Scrub, Desert Wash, Desert Succulent Shrub, Juniper, Mixed Chaparral, Montane Chaparral, Pinyon-Juniper, Sagebrush, and Valley Foothill Riparian. *Elevation Range*: 650 to 2,500 feet. *Species Range*: Range delineated using watersheds generally within the following ecological subsections – Fontana Plain - Calimesa Terraces, Los Angeles Plain, San Gabriel Mountains, Santa Ynez - Sulphur Mountains, Sierra Pelona - Mint Canyon, Perris Valley and Hills, San Gabriel Mountains, San Jacinto Foothills – Cahuilla Mountains, and Santa Ana Mountains.
Core Suitable Habitat	Core suitable habitat are areas within the potentially suitable habitat where the following landforms and the preferred soil textures are known to occur. *Landforms*: alluvial fans, alluvial flats, fan aprons, fan piedmonts, fan remnants, fan skirts, fans, fluvial terraces, inset fans, alluvial plain remnants, alluvial plains, and fan piedmonts. Landform polygons are selected for inclusion in the model results when they were composed of at least 25% of the above components. *Soil Texture*: Coarse sand, Fine sand, Loamy coarse sand, Loamy fine sand, Loamy sand, Loamy very fine sand, Sand, Very fine sand. Soil polygons are selected for inclusion in the model results when they were composed of at least 10% of the above components.

Arroyo Toad (*Anaxyrus californicus*)	
Suitable Breeding Habitat	The most favorable breeding habitat for arroyo toads consists of slow-moving streams with shallow pools, nearby sandbars, and adjacent stream terraces. Often the width of the breeding habitat is dependent on channel geomorphology and floodplain with. Suitable breeding habitat is identified by: 1. Within the overall project study areas, limited to stream systems known to be occupied by arroyo toad, or containing its designated critical habitat. 2. An average width of 20 feet around streams mapped as breeding areas. Within the HSR project impact footprints, a more detailed review of aerial imagery and/or field reconnaissance has been performed to map the extent of breeding habitat. 3. Aquatic features have been selected based on specific landcover types and specific National Wetlands Inventory (Cowardin classification) features, as follows: 3a. CWHR vegetation cover types: Valley Foothill Riparian; Valley Foothill Riparian, Desert Riparian; Desert Riparian; Desert Riparian, Desert Wash; Desert Wash; Valley Foothill Riparian, Montane Riparian; Montane Riparian; Freshwater Emergent Wetland; Lacustrine, Riverine; Riverine; Riverine, Barren; Riverine, Lacustrine; Saline Emergent Wetland. 3b. National Wetlands Inventory selections: palustrine freshwater emergent wetland; riverine intermittent with streambed or unconsolidated shore; riverine lower perennial with aquatic bed, emergent, rock bottom, rocky shore, unconsolidated bottom, or unconsolidated shore; riverine upper perennial with aquatic bed, emergent, rock bottom, rocky shore, unconsolidated bottom, or unconsolidated shore; palustrine freshwater forested/shrub wetland; or other palustrine with unconsolidated bottom or unconsolidated shore.
Non-breeding Upland Habitat / Permeable Movement Area	Upland habitat is used for movement and dispersal as well as for aestivation by burrowing in soil during the dry periods. Suitable upland habitat consists of non-breeding upland habitat, which defined by natural land cover types, and permeable movement area, which is defined by developed and agricultural land cover types. Suitable upland habitat is identified by: 1. A slope limitation such that suitable upland habitat is all at elevations of no more than 80 feet higher than adjacent modeled breeding habitat. 2. Expansion from the modeled breeding habitat based upon a cost distance function with the cost based on the land-

	use type. In practice this limits potential upland habitat to an area within a maximum of 1/2 mile from modeled aquatic habitat. The cost distance function varies from minimum values (a 1/2-mile range) for vacant land and other very low-density land uses, up to maximum values (approximately a 90-foot range) for highly developed land uses.
Southwestern Willow Flycatcher (*Empidonax traillii extimus*)	
Potentially Suitable Habitat	Suitable habitat typically consists of dense tree or shrub cover (≥ 3 m) with dense twig structure and foliage, and may include interspersed patches of open habitat. Vegetative composition can range from all native species to a mix of native and nonnative species or monotypic stands of nonnative species, but almost always includes willow (*Salix* spp.) and/or tamarisk (*Tamarix* spp.). Breeding southwestern willow flycatchers are riparian obligates. Nests are located near surface water or saturated soils; water availability at a site may range from inundated to dry from year to year or during the breeding season. Riparian habitats lacking suitable conditions and adjacent to territories may function as secondary habitat used for foraging. This model combines an existing regional model developed by USGS researchers (Hatten model) that identifies and ranks core habitat and adds other areas of potentially suitable habitat based on wildlife habitat relationships. The Hatten Southwestern Willow Flycatcher Model is a very complex model that integrates GIS, Landsat TM data, and logistic regression. Input variables include floodplain size, vegetation density, and variation in vegetation density and amount of dense vegetation. Output of the Hatten Model is categorized and ranked into classes of habitat value. Generally, the top 3 classes are distributed in GIS format and represents the areas of highest suitability for southwestern willow flycatcher. We refer the reader to the full model description contained in Hatten 2016 for further information, as the details are too complex to describe here. *Potentially Suitable Habitat*: Suitable vegetation types includes riparian habitat, which includes the following WHR types: Desert Riparian, Fresh Emergent Wetland, Montane Riparian, Riverine, and Valley Foothill Riparian. The Hatten Model output is displayed within the riparian habitat as defined above. Then the Hatten Model output was classified into the following habitat suitability categories:

	• *Very High Potentially Suitable Breeding Habitat*: Hatten Model probability score of 5. • *High Potentially Suitable Breeding Habitat*: Hatten Model probability score of 4. • *Moderate Potentially Suitable Breeding Habitat*: Hatten Model probability score of 3. • *Other Potentially Suitable Breeding Habitat*: Suitable riparian habitat not mapped in the top 3 classes of the Hatten Model. • *Southwestern Willow Flycatcher Core Breeding Habitat*: Potentially suitable habitat within southwestern willow flycatcher Critical Habitat
Coastal California Gnatcatcher (*Polioptila californica californica*)	
San Diego Management and Monitoring Program (SDMMP) Model – Gnatcatcher Primary Habitat	As part of a program to conduct long-term coordinated monitoring of CAGN across the species' range, the SDMMP model was developed on the basis of a statistical modeling approach (partitioned Mahalanobis D2 approach). CAGN location records were compiled for 2000 to 2013 from a variety of sources and a set of environmental variables (elevation, topographical heterogeneity, slope in degrees, northness, eastness, precipitation, temperature, vegetation, normalized difference vegetation index (NDVI), modeled sagebrush) were used to develop the SDMMP model. Mahalanobis D2 represents a standardized distance between the multivariate mean for environmental variables at locations where a species occurs and values calculated for the same set of environmental variables at each grid point in the landscape being modeled. The more similar environmental characteristics are at a point in the landscape to the species' multivariate mean, the more suitable the habitat is for the species. Habitat suitability for each grid cell in the study area is indicated by a Habitat Similarity Index (HSI) value that ranges from 0 (least similar to occupied habitat and considered least suitable) to 1 (most similar to occupied habitat and most suitable). The HSI value scores were grouped in the broader categories of habitat value based on the following: • *Very High Value Habitat* = 0.75-1.00 • *High Value Habitat* = 0.50 – 0.74 • *Moderate Value Habitat* = 0.25-0.49 • *Low Value Habitat* = 0-0.24
Gnatcatcher Secondary Habitat	"Secondary" habitat is anywhere within the species range that meets all model criteria but is outside the "preferred" vegetation community association, namely coastal sage scrub. Otherwise,

	the quality valuation are the same as "Primary Gnatcatcher Habitat."
Least Bell's Vireo (*Vireo bellii pusillus*)	
Core Breeding Habitat	Suitable riparian habitat within Critical Habitat areas. Select suitable California Wildlife Habitat Relations (CWHR) vegetation types, including Desert Riparian, Fresh Emergent Wetland, Montane Riparian, Riverine, and Valley Foothill Riparian, that occur within Critical Habitat.
Breeding Habitat	Suitable riparian habitat outside of Critical Habitat. Same selected riparian habitats, but within current range.
Recolonization Breeding Habitat	Suitable riparian habitat within historical range where the expanding species population is beginning to recolonize. Same selected riparian habitats, but within historic range.

APPENDIX 3

Section 7 Consultation and Conference California High Speed Rail Palmdale to Burbank Section
Los Angeles County, California

CONSERVATION MEASURES[5]

The Authority has agreed to implement the below avoidance and minimization measures in association with the project. We consider these measures to be part of the action, and our analysis assumes they will be implemented.

CM-GEN-01: Establish Qualified Biologist and Biological Monitor

At least 15 days prior to the onset of activities, the Authority will submit, for review and approval by the USFWS, the name(s), contact information, and relevant qualifications and experience of biologists who will conduct activities specified in the following measures. The roles of biologists will be as follows:

- **Project Biologists.** For each section or construction package, Authority will identify a Project Biologist(s). For their section or construction package, the Project Biologist(s) will be responsible for implementation of the conservation measures, oversee the scheduling and work of Designated Biologists and General Biological Monitors, and develop compliance reporting.

- **Designated Biologists.** Designated Biologists will be responsible for directly overseeing and reporting the implementation of general and species-specific conservation measures. Designated Biologists may be USFWS-approved on a species-specific basis, in which case Designated Biologists will only be authorized to conduct surveys and implement other measures for the covered species for which they have been approved. The Designated Biologists will have support from Biological Monitors. Designated Biologists will submit memoranda and reports to document compliance with conservation measures.

- **Biological Monitors.** Biological Monitors will report directly to a Designated Biologist for implementation of species measures or directly to the Project Biologist for implementation of general measures. Biological Monitors will be responsible for conducting Worker Environmental Awareness Program (WEAP) training, implementing general conservation measures, conducting compliance monitoring, and reporting their compliance monitoring activities. Biological Monitors also may assist Designated Biologists in implementing species-specific conservation measures under the direct, on-site, supervision of the

[5] The measures included in this biological opinion are a subset of all the measures that the Authority will implement. To avoid discrepancies in text, citations included in this appendix appear exactly as they do in the Authority's measures. For example, *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* is cited as "CDFW 2018b" even though there is not a "CDFW 2018a" in this appendix.

Designated Biologist. Resumes of Biological Monitors with specific and documented species experience may be submitted on a case-by-case basis to the USFWS for review and approval.

No ground-disturbing project activities (e.g., geotechnical investigations, utility realignments, creation of staging areas, or initial vegetation clearing and grubbing) will begin until written authorization is received from the USFWS. The USFWS will review and provide authorization within 15 calendar days of submittal of resumes and request for authorization.

CM-GEN-02: Conduct Monitoring of Construction Activities

During any initial ground or vegetation-disturbing activity, the Designated Biologist will be present in the work area to verify compliance with avoidance and minimization measures, to establish Environmentally Sensitive Areas (ESA), and install wildlife exclusion fencing (WEF) and construction exclusion fencing (exclusion fencing).

The Designated Biologist will monitor construction activities that occur in or adjacent to aquatic resources, including activities associated with the installation of protective barriers (e.g., silt fencing, sandbags, fencing), install and/or removal of creek material to accommodate crossings, construction of access roads, and removal of vegetation. As part of this effort, the Designated Biologist will document compliance with applicable avoidance and minimization measures including measures set forth in regulatory authorizations issued by USFWS.

CM-GEN-03: Prepare and Implement a Weed Control Plan

Prior to any ground-disturbing activity during the construction phase, the Project Biologist will develop a WCP, subject to review and approval by the Authority and USFWS. USFWS-recommended measures will be incorporated, as applicable.

The purpose of the WCP is to establish approaches to minimize and avoid the spread of invasive weeds during ground-disturbing activities during construction and operations and maintenance. The WCP will include, at a minimum, the following:

- A requirement to delineate ESAs in the field prior to weed control activities
- A schedule for weed surveys to be conducted in coordination with the BRMP
- Success criteria for invasive weed control will be linked to the BRMP standards for on-site work during ground-disturbing activities. In particular, the criteria will establish limits on the introduction and spread of invasive species, as defined by the California Invasive Plant Council, to less than or equal to the pre-disturbance conditions in the area temporarily affected by ground-disturbing activities. If invasive species cover is found to exceed pre-disturbance conditions by greater than 10 percent or is 10 percent greater than levels at a similar, nearby reference site, a control effort will be implemented. If the target, or other success criteria identified in the WCP, has not been met by the end of the WCP monitoring and implementation period, the Authority will continue the monitoring and control efforts, and remedial actions will be identified and implemented until the success criteria are met.

- Provisions to ensure consistency between the WCP and the RRP, including verification that the RRP includes measures to minimize the risk of the spread and/or establishment of invasive species and reflects the same revegetation performance standards as the WCP

- Identification of weed control treatments, including permitted herbicides and manual and mechanical removal methods

- Timeframes for weed control treatment for each plant species

CM-GEN-04: Prepare Plan for Dewatering and Water Diversions

Prior to initiating any construction activity that occurs within open or flowing water, the Authority will prepare a dewatering plan, which will be subject to the review and approval by USFWS. The plan will incorporate measures to minimize turbidity and siltation. The Designated Biologist will monitor the dewatering and/or water diversion sites, including collection of water quality data, as applicable. Prior to the dewatering or diverting of water from a site, the Designated Biologist will conduct pre-activity surveys to determine the presence or absence of federally listed species in the affected waterbody. If federally listed species cannot be avoided, the Authority will reinitiate Section 7 consultation with the USFWS.

CM-GEN-05: Prepare and Implement a Construction Stormwater Pollution Prevention Plan

Prior to any ground-disturbing activities, the Authority will comply with the State Water Resources Control Board Construction General Permit requiring preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP). The Construction SWPPP will propose best management practices (BMP) to minimize potential short-term increases in sediment transport caused by construction, including erosion control requirements, stormwater management, and channel dewatering for affected stream crossings. These BMPs will include measures to incorporate permeable surfaces into facility design plans where feasible, and how treated stormwater would be retained or detained onsite. Other BMPs shall include strategies to manage the amount and quality of overall stormwater runoff. The Construction SWPPP will include measures to address, but are not limited to, the following:

- Managing hydromodification to verify maintenance of pre-project hydrology by emphasizing on site retention of stormwater runoff using measures such as flow dispersion, infiltration, and evaporation (supplemented by detention where required). Additional flow control measures would be implemented where local regulations or drainage requirements dictate.

- Implementing practices to minimize the contact of construction materials, equipment, and maintenance supplies with stormwater.

- Limiting fueling and other activities using hazardous materials to areas distant from surface water, providing drip pans under equipment, and daily checks for vehicle condition.

- Implementing practices to reduce erosion of exposed soil, including soil stabilization, regular watering for dust control, perimeter siltation fences, and sediment catchment basins.
- Implementing practices to maintain current water quality, including siltation fencing, wattle barriers, stabilized construction entrances, grass buffer strips, ponding areas, organic mulch layers, inlet protection, storage tanks and sediment traps to arrest and settle sediment.
- Where feasible, avoiding areas that may have substantial erosion risk, including areas with erosive soils and steep slopes.
- Using diversion ditches to intercept surface runoff from off site.
- Where feasible, limiting construction to dry periods when flows in water bodies are low or absent.
- Implementing practices to capture and provide proper off-site disposal of concrete wash water, including isolation of runoff from fresh concrete during curing to prevent it from reaching the local drainage system, and possible treatments (e.g., dry ice).
- Developing and implementing a spill prevention and emergency response plan to handle potential fuel and/or hazardous material spills.

Implementation of a SWPPP will be performed by the Construction Contractor as directed by the Contractor's Qualified SWPPP Practitioner or designee. As part of that responsibility, the effectiveness of construction BMPs must be monitored before, during, and after storm events. Records of these inspections and monitoring results will be submitted to the local regional water quality control board as part of the annual report required by the Statewide Construction General Permit. The reports are available to the public online. The state and regional water quality control boards will have the opportunity to review these documents.

CM-GEN-06: Prepare and Implement a Spill Prevention Plan

Prior to any ground-disturbing activities, the Authority will prepare a Construction Management Plan addressing spill prevention. A Spill Prevention, Control, and Countermeasure Plan (or Soil Prevention and Response Plan if the total aboveground oil storage capacity is less than 1,320 gallons in storage containers greater than or equal to 55-gallons) will prescribe BMPs to follow to prevent hazardous material releases and clean-up of any hazardous material releases that may occur. The Plan will be submitted to the Authority for review and approval.

CM-GEN-07: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training

Prior to any ground-disturbing activity, the Project Biologist will prepare a WEAP to train construction crews to recognize and identify sensitive biological resources that may be encountered in the vicinity of the project footprint. The WEAP training materials will be submitted to the Authority for review and approval. A video of the WEAP training prepared and

presented by the Project Biologist and approved by the Authority may be used if the Designated Biologist or Biological Monitor is not available to present the training in person.

At a minimum, WEAP training materials will include the following information: key provisions of FESA, the California Endangered Species Act, the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, California Fish and Game Code 1600, Porter-Cologne Water Quality Control Act, and the Clean Water Act; the consequences and penalties for violation or noncompliance with these laws and regulations and project authorizations; identification and characteristics of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities and explanations about their ecological value; hazardous substance spill prevention and containment measures; the contact person and procedures in the event of the discovery of a dead or injured wildlife species; and review of avoidance, minimization, and mitigation measures.

The Designated Biologist or Biological Monitor will present WEAP training to all construction personnel prior to working in the project footprint. As part of the WEAP training, construction timing in relation to species' habitat and life-stage requirements will be detailed and discussed on project maps, which will show areas of planned minimization and avoidance measures. Crews will be informed during the WEAP training that, except when necessary as determined in consultation with the Designated Biologist or Biological Monitor, travel in the project footprint is restricted to established roadbeds, which include all pre-existing and project-constructed unimproved and improved roads. Training materials will include a fact-sheet handout or wallet-sized card conveying this information to be distributed to all participants in WEAP training sessions and will be provided in other languages as necessary to accommodate non-English speaking workers. All construction staff will attend the WEAP training prior to beginning work on-site and will attend WEAP training on an annual basis, thereafter.

Upon completion of the WEAP training, each construction crew training attendee will sign a form stating that they attended the training, understood the information presented, and agreed to comply with the requirements set out in the WEAP training. The Project Biologist will submit the signed WEAP training forms to the Authority monthly, and annually, the Authority will certify that WEAP training had been provided to all construction personnel. Each month, the Project Biologist will provide updates relevant to the training to construction personnel during the daily safety (tailgate) meeting.

CM-GEN-08: Conduct Operation and Maintenance Period WEAP

Prior to initiating O&M activities, O&M personnel will attend a WEAP training session arranged by the Authority. At a minimum, O&M WEAP training materials will include the following information: key provisions of FESA, the California Endangered Species Act, the Bald and Golden Eagle Protection Act, the Migratory Bird Treaty Act, Porter-Cologne Water Quality Control Act, and the Clean Water Act; the consequences and penalties for violation or noncompliance with these laws and regulations and project authorizations; identification and characteristics of special-status plants, special-status wildlife, jurisdictional waters, and special-status plant communities and explanations about their ecological value; hazardous substance spill

prevention and containment measures; and the contact person in the event of the discovery of a dead or injured wildlife species. The training will include an overview of provisions of the BRMP, annual vegetation and management plan, WCP, and security fencing, ESAs, and WEF maintenance plans pertinent to O&M activities. A fact sheet prepared by the Authority environmental compliance staff will be prepared for distribution to the O&M employees. The training will be provided by the Authority's environmental compliance staff. The training sessions will be provided to employees prior to their involvement in any O&M activity and will be repeated for all O&M employees on an annual basis. Upon completion of the WEAP training, O&M employees will, in writing, verify their attendance at the training sessions and confirm their willingness to comply with the requirements set out in those sessions.

CM-GEN-09: Establish Monofilament Restrictions

Prior to any ground-disturbing activity, the Biological Monitor will verify that plastic monofilament netting (erosion control matting) or similar material is not being used as part of erosion control materials. Non-monofilament substitutes including coconut coir matting, tackified hydroseeding compounds, rice straw wattles, and reusable erosion, sediment, and wildlife control systems that have been approved by the regulatory agencies (e.g., ERTEC Environmental Systems products) may be used.

CM-GEN-10: Avoid Animal Entrapment

At the beginning and end of each workday all excavated, steep-walled holes or trenches that are more than eight inches deep with sidewalls steeper than a 1:1 (45 degree) slope will be inspected for trapped animals and, at the close of each day, will be covered with plywood or similar materials or provided a minimum of one escape ramp constructed of fill earth per 10 feet of trenching. Before such holes or trenches are filled, they will be thoroughly inspected for trapped wildlife by the Biological Monitor(s).

All construction pipe, culverts, or similar structures with a diameter of three inches or greater that are stored overnight in the project footprint will be covered and elevated at least one foot above ground. Pipes or similar structures, regardless of diameter, will be stored such that avian entrapment is avoided. All pipes, culverts, and similar structures will be inspected for wildlife before such material is moved, buried, or capped.

CM-GEN-11: Delineate Equipment Staging Areas and Traffic Routes

Prior to any ground-disturbing activity, the Designated Biologist and Biological Monitor(s) will establish staging areas for construction equipment in areas that minimize effects to sensitive biological resources, including habitat for special-status species, seasonal wetlands, and wildlife movement corridors. Staging areas (including any temporary material storage areas) will be in areas that will be occupied by permanent facilities, where practicable. Equipment staging areas will be identified on final project construction plans. The Designated Biologist and Biological Monitor(s) will flag and mark access routes to ensure that vehicle traffic in the project footprint is restricted to established roads, construction areas and other designated areas.

CM-GEN-12: Stockpile and Redistribute Excavated Soil

Excavated materials will be stockpiled and redistributed as follows:

- **Stockpiling of Excavated Materials.** Contractors will temporarily store excavated materials produced by ground-disturbing activities in designated stockpile areas at or near the excavation site, and in the project footprint or another authorized location.
- **Handling of Topsoil.** The collection, stockpiling, and redistribution of topsoil will be conducted as described in the RRP.

CM-GEN-13: Dispose of Construction Spoils and Waste

The contractor will dispose of waste materials associated with construction, including soil materials unsuitable for reuse, in local landfills permitted to take these types of materials, and in conformance with State and federal laws.

CM-GEN-14: Clean Construction Equipment

Prior to any ground or vegetation-disturbing activity, the Authority will ensure that all equipment entering the work area is free of mud and plant materials. The Authority will establish vehicle cleaning locations designed to isolate and contain organic materials and minimize opportunities for weeds and invasive species to move in and out of the project footprint. Cleaning may be done by washing with water, blowing with compressed air, brushing, or other hand cleaning. The cleaning areas will be located so as to avoid impacts to surface waters, and appropriate SWPPP and BMPs will be implemented to further control any potential for the spread of weeds or other invasive species. Cleaning stations will be inspected regularly (at least monthly).

CM-GEN-15: Establish Environmentally Sensitive Areas and Non-Disturbance Zones

Prior to any ground-disturbing activity in a work area, the Project Biologist will use flagging to mark ESAs that support special-status species or aquatic resources and are subject to seasonal restrictions or other avoidance and minimization measures. The Project Biologist will also direct the installation of WEF to prevent special-status wildlife species from entering work areas. The WEF will have exit doors to allow animals that may be inside an enclosed area to leave the area. The Project Biologist will also direct the installation of construction exclusionary fencing (exclusionary fencing) at the boundary of the work area, as appropriate, to avoid and minimize impacts to special-status species or aquatic resources outside of the work area during the construction period. The ESAs, WEF, and exclusionary fencing will be fine mesh material (e.g., Animex Fencing or similar) and delineated by the Designated Biologist based on the results of habitat mapping or modeling and any pre-construction surveys, and in coordination with the Authority. The ESA, WEF, and exclusionary fencing locations will be identified and depicted on an exclusion fencing exhibit. The purpose of the ESAs and WEF will be explained at WEAP training and the locations of the ESA and WEF areas will be noted during worker tailgate sessions.

Fencing installation will be monitored by a Designated Biologist or Biological Monitor to ensure that federally listed species are not injured or killed during installation. Temporary fencing will be installed in areas of construction that are beyond the perimeter of the right-of-way or in areas where construction staging will occur. After installation of the temporary fencing, the work area will be surveyed by a Designated Biologist(s) to confirm the absence of federally listed wildlife. The ESA, WEF, and exclusionary fencing will be regularly inspected and maintained by the Designated Biologist or Biological Monitors to ensure its integrity and that wildlife are not trapped.

CM-GEN-16: Install Aprons or Barriers within Security Fencing

Prior to final construction design the Project Biologist will review the fencing plans along any portion of the permanent right-of-way adjacent to natural habitats and confirm that the permanent security fencing will be enhanced with a barrier (e.g., fine mesh fencing) that extends at least 12 inches below ground and 12 inches above ground to prevent special-status reptiles, amphibians, and mammals from moving through or underneath the fencing and gaining access to areas in the right-of-way. At the 12-inch depth of the below grade portion of the apron, it will extend or be bent at an approximately 90-degree angle and oriented outward from the right-of-way a minimum of 12 inches, to prevent fossorial wildlife from digging or tunneling below the security fence. A climber barrier (e.g., rigid curved or bent overhang) will be installed at the top of the apron to prevent wildlife from climbing over the apron. The Project Biologist may coordinate with the USFWS prior to completion of the fencing design.

The Project Biologist will ensure that the selected apron material and climber barrier will not have the potential cause harm, injury, entanglement, or entrapment to wildlife species. The Authority will provide for yearly inspection and repair of the fencing.

Prior to construction and operation, the Project Biologist will field inspect the fencing along any portion of the permanent right-of-way that is adjacent to natural habitats and confirm that the fencing has been appropriately installed. Both the fencing plan review and field inspection will be documented in memorandums from the Project Biologist and provided to the Authority.

CM-GEN-17: Minimize Effects to Wildlife Movement Corridors during Construction

The Authority will avoid placing fencing, either temporarily or permanently, within known wildlife movement corridors in those portions of the alignment where the tracks are elevated (e.g., viaducts or bridges), when possible. The Authority will avoid conducting ground-disturbing activities in wildlife movement corridors during nighttime hours, when possible, and will shield nighttime lighting to avoid illuminating wildlife movement corridors in circumstances where avoidance of such activities is not possible.

CM-GEN-18: Establish Wildlife Crossings

The Authority will create two dedicated wildlife crossings across the alignment to accommodate wildlife movement under permanently fenced infrastructure at the following locations.

- Near East Barrel Springs Road (east of Una Lake)
- South of the Soledad Siphon (south of the California Aqueduct)

Prior to final construction design, the Project Biologist shall confirm appropriate placement and dimensions of wildlife crossings.

For terrestrial wildlife, crossings will conform to the minimum spacing and dimensions discussed in the Palmdale to Burbank Project Section: Wildlife Corridor Assessment Report (Authority 2019c) unless different dimensions are specified in authorizations issued under FESA or CESA. All wildlife crossings would include the following features: native earthen bottom, unobstructed entrances, and openness factor of at least 0.41 and line of sight. To the extent feasible, all wildlife crossings created specifically for terrestrial species will include the following features and design considerations:

- Ledges or tunnels incorporated into the design to facilitate safe passage of small mammals.
- Year-round absence of water for a portion of the width of the crossing (i.e., no flowing water).
- Slight grade at approaches to prevent flooding.
- Limited open space between crossing and cover/habitat.
- Separation from human use areas (e.g., trails, multi-use undercrossings).
- Avoidance of artificial light at approaches to wildlife crossings.
- Undercrossings intended to be used by large mammals (i.e., mule deer) within the mule deer species range will have a 10-foot-tall concrete arch to accommodate the mammals' larger stature.
- Any culvert intended to function as an undercrossing for carnivores and small animals will be no smaller than a 6-foot-wide arch culvert for lengths up to 200 feet, or an 8-foot-wide arch culvert for lengths up to 300 feet. The substrate will be natural soil of the surrounding area, and the grade would not exceed 2 percent. Culverts longer than 200 feet will not be considered wildlife crossing structures. If any portion of the bottom of the wildlife undercrossing is likely to be inundated longer than 24 hours at least once per year, the structure would have a dry ledge. Ledges or tunnels and cover features to prevent predation will also be incorporated into the design to facilitate safe passage of small wildlife. The structure will be straight enough that a mammal entering the culvert can see the other end of the culvert.

Slope within the crossing structure will be consistent with the natural (preconstruction) grade (optimally less than 2 percent). Slopes that follow natural grades greater than 2 percent are acceptable in bridged undercrossings (viaducts).

CM-GEN-19: Work Stoppage

During construction activities, the Designated Biologists and general Biological Monitors will have stop work authority to protect any federally listed wildlife species in the project footprint. This work stoppage will be coordinated with the Authority or its designee. The Contractor will suspend ground-disturbing activities in the work area(s) where the potential construction activity could result in "take" of listed species; work may continue in other areas. The Contractor will continue the suspension until the individual leaves voluntarily or is moved to an approved release area using USFWS-approved handling techniques and methods, or as required by the USFWS.

CM-GEN-20: Enforce Construction Speed Limit

A speed limit of 15 miles per hour will be enforced during project construction for all vehicles operating on unimproved access roads and in temporary and permanent construction areas in the limit of direct effect.

CM-GEN-21: Implement Avoidance of Nighttime Light Disturbance

Prior to construction (any ground-disturbing activity requiring nighttime construction), the Contractor shall prepare a technical memorandum verifying how the Contractor will shield nighttime construction lighting and direct it downward in such a manner to minimize the light that falls outside the construction site boundaries. The technical memorandum will be submitted to the Authority for review and approval.

CM-GEN-22: Implement Water or Dust Palliative Measures

Water or dust palliatives will be applied to the construction right-of-way, dirt roads, trenches, spoil piles, and other areas where ground disturbance takes place to minimize dust emissions and topsoil erosion. Dust palliatives will be nontoxic to wildlife and plants. For construction in suitable habitat for listed species, the Biological Monitor will patrol areas of disturbance to ensure that water does not puddle for long periods and attract listed species (e.g., desert tortoise), common ravens (*Corvus corax*), or other wildlife to the project site. Operational ponding will be avoided through careful grading and hydrologic design. Water tanks will be covered with secure lids. Leaking hoses, tanks, or other sources of inadvertent pooling will be repaired immediately or moved offsite.

CM-GEN-23: Design the Project to be Bird Safe

Prior to final construction design, the Authority, in consultation with the Project Biologist, will ensure that the catenary system, masts, and other structures such as fencing, electric lines, communication towers and facilities are designed to be bird and raptor-safe in accordance with the applicable recommendations presented in *Suggested Practices for Raptor Protection on*

Power Lines: The State of the Art in 2006 (Avian Power Line Interaction Committee 2006) and *Reducing Avian Collisions with Power Lines: State of the Art in 2012* (Avian Power Line Interaction Committee 2012). Avian Power Line Interaction Committee recommendations include, but are not limited to:

- Ensuring sufficient spacing or covering of phase conductors to prevent bird electrocution
- Configuring lines to reduce vertical spread of lines and/or decreasing the span length if such options are feasible
- Marking lines and fences (e.g., Bird Flight Diverter for fencing and lines) to increase the visibility of lines and reduce the potential for collision, and where fencing is necessary, using bird compatible design standards to increase visibility of fences to prevent collision and entanglement
- Installing perch guards to discourage avian presence on and near project facilities
- Eliminating use of guy wires on communication towers or similar structures.
- Using monopole design for communication towers or similar structures to minimize perching and nesting opportunities; communication towers conform to *Recommended Best Practices for Communication Tower Design, Siting, Construction, Operation, Maintenance, and Decommissioning* (USFWS 2021)
- Reusing or co-locating new transmission facilities and other ancillary facilities with existing facilities and disturbed areas to minimize habitat impacts and avoid collision risks
- Using facility lighting that does not attract birds or their prey to project sites, including using non-steady burning lights (red, dual red and white strobe, strobe-like flashing lights) to meet Federal Aviation Administration requirements, using motion or heat sensors and switches to reduce the time when lights are illuminated, using appropriate shielding to reduce horizontal or skyward illumination, and not using high-intensity lights (e.g., sodium vapor, quartz, and halogen); not installing lighting under viaduct and bridge structures in riparian habitat areas
- Avoiding the siting of transmission lines across canyons or on ridgelines to prevent bird and raptor collisions when possible
- Installing bird flight diverters on all facilities spanning or within 1,000 feet of stream and wash channels, canals, ponds, and any other natural or artificial body of water
- Installing fencing or other type of flight diverter on all viaduct structures to encourage birds and raptors to fly over the HSR and avoid flying directly in the path of on-coming trains
- Ensuring poles do not have openings that could entrap birds, including sealing or capping all openings in poles or providing for escape routes (e.g., openings accommodating escape for various species)
- Designing aerial structures (e.g., viaducts and bridges) and tunnel portals to discourage birds and bats from roosting in expansion joints or other crevices
- Insulated wire or tree wire will be used for all electrical conduits to increase visibility of wires.

CM-GEN-24: Tunnel Construction Methods and Approaches within the Angeles National Forest Involving Tunnel Boring Machines, Tunnel Lining Systems, and Tunnel Grouting to Avoid and Minimize Changes in Groundwater Levels as a Result of Tunnel Construction

Tunnel Boring Machines

Tunnel Boring Machines (TBMs) would be designed to operate in either an open hard rock tunneling mode (open-mode) or a pressurized tunneling mode (closed-mode). TBMs capable of operating in either of these modes are referred to as "hybrid" TBMs. Closed-mode operations would effectively prevent seepage from occurring at the cutterhead, even under difficult ground conditions.[6] Open-mode operation, however, would not be as effective at reducing potential changes in groundwater levels as closed-mode operation. The mode of operation that would be employed would be determined by the specific conditions encountered along the tunnel alignment. In circumstances where groundwater pressures are below 17 bar and the tunnel alignment passed under groundwater, the TBM would operate in closed-mode. Closed-mode operation would also be used under higher pressures should future technologies allow for such operation. The pressurization of the face[7] would be achieved with either of the two main tunneling machines that would be used for the project: Slurry[8] or Earth Pressure Balance (EPB) machines. The type of TBM that would be used for the Build Alternatives cannot be identified at this time, since the selection of a TBM type would depend on a detailed knowledge of the geotechnical and hydrogeological ground conditions that exist along the alignments. Nevertheless, Slurry TBMs are generally more compatible with the high water pressure conditions that would be encountered under the Build Alternatives.

The TBM would be designed with ports for drilling horizontal probe holes through the TBM cutterhead, and angled probe holes through the TBM shields. These holes would allow for water pressures and flow rates to be measured ahead of the TBM. The probe holes, equipped with blow out preventers, would allow for pre-excavation grouting ahead of the TBM to cut-off groundwater inflows into the tunnel. The design and configuration of probe/grout holes would allow for concurrent drilling and grouting of multiple holes ahead of the TBM, and around the

[6] Difficult ground conditions are considered to be soil, rock or water conditions that add difficulty to the mining of tunnels. These conditions may include: very weak rock, very strong rock, rock bursting where the exposed rock releases in-situ stress as an explosive failure, sheared rock, granular soil that can run into a tunnel (Running Ground), saturated soil that can flow into a tunnel (flowing ground), unstable rock that needs special support (e.g., rock bolts, spiling, permeation grouting, and shotcrete application) to prevent the tunnel from collapsing, swelling/squeezing ground where the ground pressures exceed the rock strength and the tunnel wall deforms resulting in the tunnel walls converging toward one another, high groundwater pressures, and high groundwater flow volumes.

[7] Pressure acting on the tunnel face results from pressure of groundwater and the pressure of the rock or soil pushing into the tunnel opening. To resist these in-situ pressures so that a TBM can be advanced against such pressure, the space between the tunnel boring machine and the rock face being excavated is pressurized (often with a bentonite-water slurry).

[8] The Slurry TBM uses a liquid slurry (often bentonite and water) to remove and transport rock and soil cuttings from the tunnel face to a disposal system.

entire tunnel perimeter. Such probing and grouting operations are most applicable to a TBM operating in an open mode and would be mandatory in that instance. (see HYD-IAMF#7).

Two other features of the TBMs would be required for the construction of tunnels. The first feature provides for the injection of pressurized bentonite to fill the void space between the TBM shield and the rock/soil outside the shield when working in a closed-mode. The second feature would be the use of an automatic tail void grouting system in which grout is injected simultaneously with the TBM advance while operating in open-face mode (see "Grouting" section below).

Tunnel Lining Systems

In circumstances where groundwater pressures are at 25 bar or less, a one-pass lining system would be installed in the tunnels that were constructed using a TBM. The lining system, which would consist of segmental, precast, concrete lining with bolted and gasketed joints, would create a watertight tunnel lining capable of resisting the groundwater pressure with minimal, if any, leakage. A one-pass lining system could potentially be used in higher pressure locations if technological advancements were sufficient to ensure watertight seals under those pressures.

In circumstances in which groundwater pressures exceed 25 bar, a two-pass lining system would be installed for TBM constructed tunnels. A two-pass lining system would also be used in all instances for conventionally mined tunnels. The two-pass lining system involves two stages of construction; a lining is installed against the rock/soil followed by a second interior lining with a waterproof membrane separating the two. The inner lining in the two-pass system would be designed to withstand the maximum groundwater pressures anticipated in the tunnels and the waterproof membrane would create a watertight seal, capable of resisting groundwater pressures.

Grouting

A multi-phase grouting program would be implemented during the construction of the tunnels. A primary objective of the grouting program would be to reduce or prevent potential groundwater flows into the tunnels. The grouting program would be implemented for both TBM constructed and conventionally mined tunnels, although in the case of conventionally mined tunnels only pre-excavation grouting and check grouting would be used.

To the extent applicable and feasible, the following grouting methods would be used during the construction of the tunnels to avoid and minimize groundwater flows into the tunnels:

- **Pre-excavation grouting—**During TBM tunnel construction using the open-mode approach, pre-excavation grouting would be implemented to reduce groundwater flow from the rock/soil mass prior to excavation, and to improve rock/soils conditions for tunneling. Systematic pre-excavation grouting ahead of the TBM would be performed to allow the TBM to advance, and the tunnel lining system to be installed, with minimum impacts to groundwater resources. Grout would be injected through the TBM shield and cutterhead holes. In circumstances where conventional mining methods are used, grout would be injected through drill holes advanced through the tunnel face and around the tunnel

perimeter. Criteria for length and direction of drill holes, number of holes, grout composition, and injection pressures would be determined based on the conditions encountered in the field. The pre-grouting would create a zone of treated rock/soil around the tunnel that would be sealed to minimize groundwater inflows. Additional grouting would be implemented radially outward from the tunnel interior to broaden the diameter of the grouted zone surrounding the tunnel, as necessary, to further reduce groundwater flows into the tunnel.

- **Steering (overcut) gap around the body of the shield—**During construction, pressurized bentonite would be injected to fill the void space between the TBM shield and the rock/soil outside the shield. The void space would be filled to seal off any potential water leakage from the cutterhead of the TBM back towards the rear of the shield. The capacity to inject pressurized bentonite is a built-in characteristic of a Slurry TBM, but this feature would need to be added to an EPB TBM if that type of TBM were to be selected. After advancing the machine, the void would be filled with the backfill grout placed around the tunnel lining (see below).

- **Backfill grouting with two-component grout—**During construction, backfill grouting would occur simultaneously with the advancement of the TBM. Grout would be injected from the tail of the shield to fill the annular gap between the TBM excavation limits and the segmental lining. The annular gap from the tail of the shield would be filled with a quick-setting grout to prevent water from traveling along the interface between the lining and the rock/soil. The accelerated two-component grout is superior to conventional cement grouts because it provides for complete and reliable backfilling of the annular gap. Moreover, this material hardens very quickly and provides resistance to water flow upon hardening.

- **Check grouting—**After the tunnel lining has been installed and backfilled, check grouting would be injected through grout ports in the tunnel lining where the back filling volume is less than the theoretical volume or there is evidence of groundwater inflow. The ports would be opened to check for voids and groundwater inflows. If any voids were detected, grout would be injected into the annular space under pressure (typically 0.7 to 1.0 bar higher than the static groundwater pressure) between the lining and rock/soil wall to control groundwater flows. The check grouting would be used for both single pass and double pass linings and would further reduce the potential for water to leak through the lining and into the tunnel.

CM-GEN-25: Implement the Water Resources Adaptive Management and Monitoring Plan

To avoid and minimize potential impacts on seeps, springs, streams, riparian vegetation, and groundwater-dependent listed plant and wildlife species, the Authority will implement an AMMP prior to, during, and after tunnel construction to implement the requirements described under CM-GEN-24 and as described below concerning biological resources.

The purpose of the AMMP relative to biological resources is to monitor groundwater-dependent biological resources within the Tunnel Construction RSA to detect and remediate adverse effects on habitat function in a timely manner. Implementation of the AMMP will provide information

and data to identify hydrological and biological effects that may arise during tunnel construction, if any, and trigger actions to offset any such impacts. The AMMP will include the following components, at a minimum, to avoid or minimize and address impacts on habitat for listed species, and aquatic resources:

- **Baseline inventory.** The Authority will establish baseline hydrologic conditions within the Tunnel Construction RSA and within paired reference sites for comparison. Baseline surveys will characterize potential aquatic resources, including but not limited to mapping of wetland and riparian vegetation; hydroperiod (the duration of inundation); flow rates; area of feature; and the potential for special-status plant and fish and wildlife species to occur.

- **Pre-tunneling supplemental water infrastructure provision.** To maintain baseline water supply, the Authority will install water storage tanks or water lines in advance of tunneling on or near properties with seeps, springs, and streams.

- **Construction monitoring.** The Authority will designate monitoring locations and methodologies for monitoring water levels, vegetation cover, and special-status species habitat most likely to be affected by tunnel construction. The Authority will monitor representative locations during periods when effects are most likely to occur. Monitoring will involve installation of flow gauges and water level sensors at springs and seeps to continuously monitor flow rates and water levels during tunnel construction. Monitoring will take advantage of remote sensing technology and telemetry to monitor water flow and water quality data in real-time, which allows for more immediate responses to any adverse changes. Additionally, water quality parameters (pH, temperature, turbidity, dissolved oxygen, and contaminants) will be regularly sampled and analyzed to detect any changes caused by tunneling activities. The Project Biologist will monitor the health and diversity of the vegetation around springs and seeps to document any changes in the surrounding environment that may indicate changes in groundwater levels. The Project Biologist will conduct surveys to monitor the presence and health of wildlife that depends on springs and seeps and will compare results to baseline pre-construction surveys to establish any potential effects from tunneling activities. If effects (e.g., lowering water levels resulting in reduced habitat) are observed, the Authority will implement contingency plans that expand monitoring beyond the representative locations and increase monitoring frequency to capture the extent of potential effects on groundwater-dependent biological resources.

- **Response Actions - Supplemental water.** The Authority would prepare contingency plans to provide supplemental water as necessary to support riparian / aquatic vegetation, wildlife breeding cycles, aquatic wildlife or protected tree health within the area of predicted effects determined through modeling or monitoring to be potentially affected by groundwater lowering. Seasonal variation as documented during the preconstruction baseline monitoring would be considered in establishing the amount of supplemental water. For all features, supplemental water would provide minimum flows and periods of inundation to match baseline conditions. The periods of supplemental water, in general, would likely be in periods of baseflow, which occurs in late spring, summer, and early fall outside of rain periods. For breeding habitats, the Authority would, at a minimum, supplement breeding habitat where

necessary to maintain adequate depths for completion of the reproduction cycle (defined as the time by which juveniles are viable and mobile such that they can feasibly leave the breeding location). However, where breeding habitat is perennial or long-seasonal, then supplemental water would be provided as necessary to maintain the entire wetted period as determined through baseline monitoring. For nonbreeding movement and foraging habitat in creeks and streams, water would be provided to maintain seasonal flow similar to baseline conditions. Water would be provided as needed to sustain habitat conditions up to the point of baseline conditions until the qualified biologist determines it is appropriate to cease its provision. If supplemental water is provided from wells, the effects on water supply and habitat features would be managed to avoid and minimize potential disruption by the selection of well location, depth, flow rate, and the use of alternative supplies.

- **Contingency plan for supplemental water in areas outside of predicted area of effec**t. The Authority would establish contingency procedures to provide supplemental water to springs, seeps, and streams to support riparian / aquatic vegetation, wildlife breeding cycles, and aquatic wildlife outside the area of predicted effects, if warranted by monitoring.

- **Post-construction monitoring**. After construction, the Authority would monitor water levels and aquatic resource conditions of affected features twice annually (spring and summer) for at least five years or as determined through consultation with USFWS. As long as groundwater levels are demonstrated to be recovering, monitoring would continue until baseline conditions return or ten years, whichever is longer. In the event that supplementary water is not successful at restoring aquatic resources to baseline conditions in the post-construction period and off-site compensation is triggered, then monitoring may be waived for certain features if it is determined that there is no further utility for monitoring the specific feature. If impacts to listed species habitat are documented, the Authority will reinitiate section 7 consultation with the Service.

CM-GEN-26: Minimize Permanent, Intermittent Noise Impacts on Special-Status Bird Habitat

To address the permanent, intermittent impact of noise on suitable special-status bird habitat, the Authority will build sound barriers to minimize or avoid such impacts in locations where suitable special-status bird habitat would be exposed to 65 A-weighted decibels of permanent intermittent noise impact outside the fenced right-of-way. Sound barriers will be designed with the goal of minimizing exposure to noise produced by HSR trains by providing a 10 A-weighted decibel attenuation of sound generated by HSR operations, as measured 50 feet from the noise barrier. Typically, this level of sound attenuation may require a 14- to 17-foot-tall sound barrier. The sound barriers will be constructed in conjunction with the installation of track and OCS and will be completed before HSR train operations begin. The location, length and height of the barriers will be determined based on detailed noise modeling for areas of suitable special-status bird habitat, and measurement of existing conditions so that the noise-attenuating effects of topography and other existing features can be accounted for during the final design phase. At a minimum, 14-foot-tall noise barriers will be installed along both sides of the SR14A alignment

where the alignment is at-grade and on viaduct and where modeled suitable habitat for federally listed bird species occurs within 1,000 feet of the project footprint.

HYD-IAMF#1 Storm Water Management

Prior to Construction, the Contractor shall prepare a storm water management and treatment plan for review and approval by the Authority. During the detailed design phase, each receiving stormwater system's capacity to accommodate project runoff will be evaluated. As necessary, on-site stormwater management measures, such as detention or selected upgrades to the receiving system, will be designed to provide adequate capacity and to comply with the design standards in the latest version of Authority Technical Memorandum *2.6.5 Hydraulics and Hydrology Guidelines*. On-site stormwater management facilities will be designed and constructed to capture runoff and provide treatment prior to discharge of pollutant-generating surfaces, including station parking areas, access roads, new road over- and underpasses, reconstructed interchanges, and new or relocated roads and highways. Low-impact development techniques will be used to detain runoff on site and to reduce off site runoff such as constructed wetland systems, biofiltration and bioretention systems, wet ponds, organic mulch layers, planting soil beds, and vegetated systems (biofilters), such as vegetated swales and grass filter strips, will be used where appropriate.

HYD-IAMF#2 Flood Protection

Prior to Construction, the Contractor shall prepare a flood protection plan for Authority review and approval. The project will be designed both to remain operational during flood events and to minimize increases in 100-year or 200-year flood elevations, as applicable to locale. Design standards will include the following:

- Establish track elevation to prevent saturation and infiltration of stormwater into the subballast.

- Minimize development within the floodplain, to such an extent that water surface elevation in the floodplain will not increase by more than 1 foot, or as required by state or local agencies, during the 100-year or 200-year flood flow [as applicable to locale]. Avoid placement of facilities in the floodplain or raise the ground with fill above the base-flood elevation.

- Design the floodplain crossings to maintain a 100-year floodwater surface elevation of no greater than 1 foot above current levels, or as required by state or local agencies, and project features within the floodway itself will not increase existing 100-year floodwater surface elevations in Federal Emergency Management Agency-designated floodways, or as otherwise agreed upon with the county floodplains manager.

The following design standards will minimize the effects of pier placement on floodplains and floodways:

- Design site crossings to be as nearly perpendicular to the channel as feasible to minimize bridge length.

- Orient piers to be parallel to the expected high-water flow direction to minimize flow disturbance.

- Elevate bridge crossings at least 3 feet above the high-water surface elevation to provide adequate clearance for floating debris, or as required by local agencies.

- Conduct engineering analyses of channel scour depths at each crossing to evaluate the depth for burying the bridge piers and abutments. Implement scour-control measures to reduce erosion potential.

- Use quarry stone, cobblestone, or their equivalent for erosion control along rivers and streams, complimented with native riparian plantings or other natural stabilization alternatives that will restore and maintain a natural riparian corridor.

- Place bedding materials under the stone protection at locations where the underlying soils require stabilization as a result of stream-flow velocity.

HYD-IAMF#3 Prepare and Implement a Construction Stormwater Pollution Prevention Plan

Prior to Construction (any ground disturbing activities), the Contractor shall comply with the SWRCB Construction General Permit requiring preparation and implementation of a SWPPP. The Construction SWPPP will propose BMPs to minimize potential short-term increases in sediment transport caused by construction, including erosion control requirements, stormwater management, and channel dewatering for affected stream crossings. These BMPs will include measures to incorporate permeable surfaces into facility design plans where feasible, and how treated stormwater will be retained or detained on site. Other BMPs shall include strategies to manage the amount and quality of overall stormwater runoff. The Construction SWPPP will include measures to address, but are not limited to, the following:

- Hydromodification management to verify maintenance of pre-project hydrology by emphasizing on site retention of stormwater runoff using measures such as flow dispersion, infiltration, and evaporation (supplemented by detention where required). Additional flow control measures will be implemented where local regulations or drainage requirements dictate.

- Implementing practices to minimize the contact of construction materials, equipment, and maintenance supplies with stormwater.

- Limiting fueling and other activities using hazardous materials to areas distant from surface water, providing drip pans under equipment, and daily checks for vehicle condition.

- Implementing practices to reduce erosion of exposed soil, including soil stabilization, regular watering for dust control, perimeter siltation fences, and sediment catchment basins.

- Implementing practices to maintain current water quality, including: siltation fencing, wattle barriers, stabilized construction entrances, grass buffer strips, ponding areas, organic mulch layers, inlet protection, storage tanks and sediment traps to arrest and settle sediment.

- Where feasible, avoiding areas that may have substantial erosion risk, including areas with erosive soils and steep slopes.

- Using diversion ditches to intercept surface runoff from off site.

- Where feasible, limiting construction to dry periods when flows in water bodies are low or absent.

- Implementing practices to capture and provide proper off-site disposal of concrete wash water, including isolation of runoff from fresh concrete during curing to prevent it from reaching the local drainage system, and possible treatments (e.g., dry ice).

- Developing and implementing a spill prevention and emergency response plan to handle potential fuel and/or hazardous material spills.

Implementation of a SWPPP will be performed by the construction contractors as directed by the contractor's Qualified SWPPP Practitioner or designee. As part of that responsibility, the effectiveness of construction BMPs must be monitored before, during and after storm events. Records of these inspections and monitoring results are submitted to the local regional water quality control board (RWQCB) as part of the annual report required by the Statewide Construction General Permit. The reports are available to the public online. The SWRCB and RWQCB will have the opportunity to review these documents.

CM-PLT-01: Conduct Presence/ Absence Pre-construction Surveys for Listed Plants

To detect the presence of federally listed plant species, the Designated Biologist(s) will conduct protocol-level surveys in all suitable habitat for federally listed plant species within the project impact footprint and 100-foot plant buffer prior to any ground- or vegetation-disturbing activities. Initially, habitat suitability assessment surveys will be performed to "ground-truth" the habitat suitability models developed in 2015. Areas that are determined to not be suitable habitat for federally listed species will not be further surveyed to protocol level, following coordination with and approval from USFWS. Where further protocol surveys are indicated based on the habitat suitability assessment, the surveys shall be consistent with *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities* (CDFW 2018b) and *Guidelines for Conducting and Report Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (USFWS 2000). Prior to surveys, and if a

reference population exists, reference populations for target survey species will be visited, to confirm blooming conditions and ensure target species have flowers or other discernible features necessary to identify plants.

The Designated Biologist will flag and record in GIS the locations of any observed federally listed plant species. If federally listed plants are detected, the Authority will reinitate Section 7 consultation with the USFWS.

CM-PLT-02: Maintenance of Existing Hydrologic Conditions to Maintain Slender-horned Spineflower Habitat Below the Preferred Alternative Alignment in Bee Canyon

To maintain habitat for slender-horned spineflower, and other federally listed plant species, hydraulic capacity in Bee Canyon and Pacoima Wash will be maintained at preconstruction conditions through the implementation of on-site stormwater management BMPs to provide runoff dispersion, infiltration, detention, and evaporation. Hydraulic capacity in Bee Canyon and Pacoima Wash will be maintained by minimizing alterations to watercourses, implementing erosion control BMPs, and maintaining existing stormwater patterns through implementation of conservation measures (CM-GEN-04 and CM-GEN-05) and HYD-IAMF#1 through HYD-IMAF#3 (Appendix K) into project design. A construction-period SWPPP (CM-GEN-05 and HYD-IAMF#3) will incorporate BMPs to reduce short-term increases in construction-site runoff, and a Stormwater Management and Treatment Plan (Appendix K, HYD-IAMF#1) will address stormwater runoff and system capacity. Water crossings will be implemented to maintain preconstruction hydraulic capacity (Appendix K, HYD-IAMF#2) and maintenance of existing drainage patterns within channels and washes (Appendix K, HYD-IAMF#1 and HYD-IAMF#3) will minimize impacts to hydraulic condition. The Authority will provide the Stormwater Management and Treatment Plan for review by USFWS at the 60 percent design stage and will provide the SWPP prior to the start of construction. If an analysis of the Stormwater Management and Treatment Plan and/or SWPPP suggests that the project will result in substantial impacts to the slender-horned spineflower and its habitat (i.e., is likely to result in a reduction in spatial distribution or density of the affected population), the Authority will coordinate with USFWS to modify project design to maintain hydrologic conditions appropriate for the slender-horned spineflower or will reinitiate consultation to address unanticipated effects.

CM-PLT-03: Compensate for Impacts on Slender-horned Spineflower

The Authority will provide compensatory mitigation for direct impacts on unoccupied slender-horned spineflower habitat and indirect impacts on occupied and unoccupied slender-horned spineflower habitat through the protection and long-term management of 195.7 acres of equal or higher quality suitable habitat. At a minimum, 143 acres of slender-horned spineflower suitable habitat will be placed in conservation prior to the start of construction. The balance of mitigation for slender-horned spineflower will be established prior to the completion of construction.

CM-PLT-04: Provide for Long-Term Monitoring and Perpetual Management of Slender-Horned Spineflower Population at Bee Canyon

The Authority will coordinate with the Service and the landowner to prepare a long-term monitoring and management plan to provide for the perpetual management of the spineflower population in Bee Canyon. The monitoring and management plan will be prepared and funded consistent with CM-Mit-01.

CM-VRN-01: Conduct Pre-construction Surveys for Vernal Pool Wildlife Species

Prior to any ground disturbing activities, the Project Biologist will conduct an aquatic habitat assessment and survey for vernal pool wildlife species in seasonal wetlands and vernal pools that occur within both the work area and the area extending 250 feet from the outer boundary of the work area where access is available, consistent with USFWS vernal pool survey protocols. The Project Biologist will visit these areas after the first rain event of the season to determine whether seasonal wetlands and vernal pools have been inundated. A seasonal wetland/vernal pool will be considered to be inundated when it holds greater than 3 centimeters of standing water 24 hours after a rain event. Approximately two weeks after the pools have been determined to be inundated, the Project Biologist will conduct surveys in appropriate seasonal wetland and vernal pool habitats. The Project Biologist will submit a report to the Authority within 30 days of completing the work. If federally listed fairy shrimp are detected, the Authority will reinitate Section 7 consultation with the USFWS.

CM-VRN-02: Implement Seasonal Vernal Pool Work Restriction

Ground disturbing activities will not occur within 250 feet of vernal pools or seasonal wetlands that are occupied by listed species during the rainy season (October 15 to April 15).

CM-VRN-03: Implement and Monitor Vernal Pool Avoidance and Minimization Measures within Temporary Impact Areas

Impacts on vernal pools occupied by listed species in work areas outside of the permanent right-of-way will be avoided. The Project Biologist will install and maintain exclusionary fencing to prevent impacts on vernal pools from construction activities.

CM-UTS-01: Implement Worker Environmental Awareness Program for Unarmored Threespine Stickleback

Prior to initiation of construction activities, implement CM-GEN-10 Prepare Worker Environmental Awareness Program (WEAP) Training Materials and Conduct Construction Period WEAP Training; prior to Operation and Maintenance activities, implement CM-GEN-11 Conduct Operation and Maintenance Period WEAP.

The WEAP will include site-specific information developed for the restriction of access to the wetted channel of the Santa Clara River, including restrictions on the introduction and handling of concrete or other contaminants, and debris and vegetation disposal.

Training will include the repercussions to unarmored threespine stickleback resulting from contaminants and debris, and access to the wetted channel.

CM-UTS-02: Establish Construction Zones and Environmentally Sensitive Areas

During temporary and permanent bridge construction, the Authority will implement CM-GEN-14 Delineate Equipment Staging Areas and Traffic Routes and CM-GEN-18 Establish Environmentally Sensitive Areas and Non-Disturbance Zones to ensure no work takes place where unarmored threespine stickleback may be affected. Additional measures include:

Prior to the commencement of construction activities, a Designated Biologist will survey the proposed work locations to confirm that the construction zone is outside the wetted channel of the river, that the proposed permanent pile installation locations are located outside of the 25-year flood zone and away from the wetted channel.

A Biological Monitor will be present during all construction and maintenance activities upstream or downstream of the bridge crossing to prevent activities, personnel, and debris from making contact with or disturbing the wetted channel of the Santa Clara River.

Prior to ground-disturbing activities, and to the extent feasible, a K-rail construction barrier and Endangered Species Act (ESA) fencing (CM-GEN-18) will be installed between the bridge construction work zone and the ESA area of the wetted channel of the Santa Clara River to prevent access to the wetted channel. The ESA will be installed a minimum of 10 feet away from the wetted channel and the K-rail will be installed approximately 10 feet from the ESA to the extent practicable.

No construction activities or personnel will occur within 10 feet of the wetted channel. Permanent structures associated with bridge construction will remain outside of the 25-year flood zone and all other construction activities associated with bridge construction, such as the installation of K-rail barriers and ESA fencing, will be remain a minimum of 10 feet away from the wetted channel.

CM-UTS-03: Santa Clara River Construction and Maintenance Activity Weather Related and Seasonal Work Restrictions

Prior to and during any storm event, a Biological Monitor will inspect work sites to ensure sites are secure so that flooding does not cause damage to tarps or plug diversion drains or allow construction materials, such as uncured concrete, and debris to flow into the river.

Seasonal Work Restrictions. All permanent bridge pier and structure construction in the Santa Clara riverbed will be completed during the dry season, defined as June 1 through November 1, and all work will completely avoid the wetted channel during construction and maintenance.

All measures implemented during bridge construction will be implemented to avoid accidental contact, spills, or falling debris into the wetted channel. During operation and maintenance (O&M), if the wetted portion of the Santa Clara River shifts in location (for example, in response

to a flood event that alters the wetted channel alignment), all maintenance and repair activities will continue to occur where those activities are outside of the wetted channel.

CM-UTS-04: Prepare and Implement Spill Prevention and Containment Measures

All fuels and components with hazardous materials or waste will be handled in accordance with applicable regulations, the Stormwater Pollution Prevention Plan (SWPPP) prepared for CM-GEN-07, and the Construction Management Plan prepared for CM-GEN-08. These materials will be kept in segregated, secured, and/or secondary containment facilities, as necessary.

During concrete pours of the permanent bridge piles and bridge decks or other structures, spill containment will be installed and maintained to prevent uncured concrete releases to the wetted channel of the Santa Clara River. Spill containment may include installation of K-rail barriers at the perimeter of work areas, between work areas and the wetted channel and/or underslung tarps to intercept all potential uncured concrete flows to the Santa Clara River.

During bridge construction, no continuous dewatering or drawdown within the shafts will occur. Casing water, if any, will be extracted and disposed of at a legal disposal site in an upland location. No other construction dewatering associated with installation of the Santa Clara River crossing bridges will occur within the work areas.

To ensure that water quality is not being affected by bridge and bank stabilization-related concrete pouring activities, the Authority will monitor the water quality at points upstream, downstream, and immediately adjacent to the construction work zone daily during concrete pouring operations. Key parameters to be monitored are pH and turbidity.

CM-UTS-05: Implement Construction or Maintenance Activity Debris Prevention Measures

Prior to initiation of construction or O&M activities, an underslung tarp, debris platform or equivalent barrier extending at least 10 feet away from the wetted channel will be deployed beneath the bridge deck to prevent the inadvertent discharge of equipment, chemicals, or debris into the Santa Clara River.

The Authority will inspect and maintain tarps, debris platforms, or equivalent barriers to ensure catchments are functioning appropriately.

CM-UTS-06: Implement Construction Measures for Unarmored Threespine Stickleback Avoidance

During the installation of piles and piers for the bridge, vibratory, oscillating, or other approved pile driving methods will be used in the Santa Clara riverbed, outside of the wetted channel 25-year flood zone, in order to avoid effects to unarmored threespine stickleback. Piles and footings associated with temporary structures required to construct the bridge will be installed and removed only by vibratory methods. Temporary piles and footings will be installed and removed at least 10 feet away from the wetted channel at the time of installation or removal.

Construction activities in areas susceptible to winter flood flows will be conducted from June 1 through September 30, when winter flood flows do not occur in the Santa Clara River. Other construction activities in areas not at risk of flood flows may be constructed year-round.

Vegetation management will be limited to trimming existing riparian vegetation outside the wetted channel. No vegetation management or personnel will occur within 10 feet of the wetted channel. Woody debris generated by vegetation management activities will be prevented from contacting the wetted channel, either by hand or by deploying physical restraints or tarps. A Designated Biologist will review, delineate, and monitor the vegetation management plan locations.

CM-UTS-07: Prepare a Construction Groundwater Dewatering Plan

The Authority will prepare for USFWS approval a Construction Groundwater Dewatering Plan for the Santa Clara River for areas close to stream flow to ensure that any dewatering is conducted in a manner that does not affect river flow or introduce pollutants. Dewatering will be implemented in a manner that (1) does not create temporary wetted channel habitat suitable for unarmored threespine stickleback; (2) does not diminish existing river flow, and therefore does not result in stranding of unarmored threespine stickleback or other fish; (3) does not extend the reach farther downstream such that fish may become stranded when discharge flows subside; and (4) does not introduce pollutants to surface waters.

The plan will include, but not be limited to:

- No direct removal of surface water from or to the Santa Clara River or activities that may result in stranding of unarmored threespine stickleback.
- Groundwater discharges will be directed to appropriate legal disposal sites in an upland area that cannot flow into the Santa Clara River or otherwise change the river's flow and water quality.
- The Authority will monitor daily surface water elevations upstream, adjacent to, and downstream of the extraction points, to assess any critical flow regimes susceptible to excessive draw down before, during, and after groundwater dewatering activities.
- The Biological Monitor will have the authority to halt dewatering activities if water levels decrease in the wetted portion of the Santa Clara River where unarmored threespine stickleback are present.

CM-UTS-08: Implement Scour Avoidance Features Around Bridge Piers

Scour and cavity (i.e., depression) formation around the base of bridge piers will be avoided through implementation of design features that prevent erosion by dissipating the energy of the water flowing around the base of piers. The following structural designs will be considered and implemented according to the best design considerations, constructability, and environmental protections at the time of construction of the project:

- Vegetated rip-rap: Biotechnical methods can be used alongside rock or other inert materials to resist hydraulic forces, stabilize the stream system and prevent scour. Such methods can include the use of brush layering and poles, grass and ground cover, willow bundles, or other vegetated features that can resist hydraulic forces, increase geotechnical stability, and prevent soil loss behind the structures. Vegetation can thrive where riprap is constructed to encourage ongoing vegetative growth, and can also function to enhance riparian habitat while also protecting stream banks and bridge piers.

- Collars: Collars are metal or concrete structures that are placed around the base of the bridge pier to prevent the erosion of the soil around it. The collars can be designed to create turbulence in the flowing water, which helps to prevent scour.

- Varying the bridge pier shape: Design the piers with a cross section hydraulically favorable to the water flow to reduce the generation of the turbulent regime and consequently of the vortices that originate the scour.

- Orientation of the bridge piers in a manner that follows the water flow lines, to minimize the bridge's obstruction to flow. This method typically involves minimizing the angle between approach flow and major horizontal axes of pier faces.

- Scour prevention features will be designed in such a way that no gaps, cracks, crevices, or spaces exist in the feature that might experience micro-scour of otherwise retain water that could strand unarmored three-spine stickleback as flows recede. Scour prevention features will be solid in structure and will be developed within the existing design footprint of the bridge structures. No additional permanent impact footprint would be required for the scour prevention features.

CM-UTS-09: Implement Avoidance Measures During Operations and Maintenance for the Santa Clara River

All maintenance of project facilities on the Santa Clara River will adhere to timing and work area restrictions, specifically:

- Maintenance activities will not take place in the wetted channel of the Santa Clara River.

- Maintenance activities and personnel will remain at least 10 feet from the wetted channel.

- Repair or replacement of bridge structures requiring access to the 25-year flood zone of the riverbed will be restricted to the period from June 1 to September 30, except in the case of an emergency.

Any dewatering necessary during O&M activities will not create a risk of fish stranding, either through draw down (zone of influence) or by flow discharge creating temporary habitat suitable for federally listed fish, nor will it involve direct removal of surface water from, or discharge to, the wetted channel of the Santa Clara River.

Maintenance activities will implement additional conservation measures, CM-UTS-01 through CM-UTS-07, as applicable to the activity.

CM-CRLF/MYLF-01: Conduct Pre-construction Surveys for Special-Status Amphibian Species

Prior to any ground disturbing activities, the Project Biologist will conduct pre-construction surveys in suitable habitat to determine the presence or absence of special-status amphibian species within the work area. These surveys will be conducted in accordance with any required agency protocols. Surveys will be conducted before the start of ground-disturbing activities in a work area providing ample time to complete a given species' protocol survey methodology. Protocol surveys for the detection of special-status amphibians will be according to CDFW Survey and Monitoring Protocols and Guidelines (https://wildlife.ca.gov/Conservation/Survey-Protocols#377281282-amphibians) and the USFWS Survey Protocols and Guidelines (https://www.fws.gov/library/collections/survey-protocols-and-guidelines-recovery-permits-pacific-southwest-region). The results of the protocol survey will be used to guide the placement of Environmentally Sensitive Areas (ESA) for avoidance of impacts to the species. If California red-legged frogs or mountain yellow-legged frogs cannot be avoided, the Authority will reinitiate Section 7 consultation with the USFWS.

CM-ARTO-01: Conduct Pre-construction Surveys for Arroyo Toad

No more than 12 months before the start of any ground or vegetation disturbing activity, a Designated Biologist will conduct a habitat assessment where modeled habitat for arroyo toad occurs in the work area, plus a 500-foot buffer where PTE has been obtained, to determine if suitable aquatic and upland habitat exists.

Where suitable habitat is present, the Designated Biologist will conduct protocol surveys for arroyo toad within 12 months prior to ground-disturbing activities, adhering to guidance in *Survey Protocol for the Arroyo Toad* (USFWS 1999b) or current guidelines at time of surveys.

- Negative survey results for arroyo toad will be considered valid for one year.
- Surveys will be repeated every one or two years as appropriate until construction is completed in the work area containing suitable habitat.
- Survey reports will be transmitted to the USFWS prior to the initiation of ground-disturbing activities at the survey sites.

CM-ARTO-02: Prepare and Implement Project Guidelines for Monitoring and Translocation of Arroyo Toad during Construction

Prior to construction activities, the Authority will implement the following measures for the monitoring and translocation of arroyo toads.

- Prior to vegetation clearing, grading, and other construction activities, the Designated Biologist will monitor arroyo toad activity in project areas containing or adjacent to breeding habitat. When sign of breeding is no longer evident (i.e., egg clutches and larvae), an exclusionary fence will be installed and clearance surveys initiated. Breeding activity generally ends late May at lower elevation and June at higher elevation.

  - After exclusionary fencing has been installed, a Designated Biologist will perform a minimum of three nighttime surveys inside the exclusionary fence and remove all arroyo toads found within its perimeter. The Designated Biologist will continue clearance surveys until there have been two consecutive nights with no arroyo toads found inside the fencing. Any breach in the exclusionary fence during times when arroyo toads are active above ground will require repeating the 3-day minimum clearance surveys for that particular work area.

  - If suitable conditions that elicit an arroyo toad emergence and movement event do not occur, the Designated Biologist will attempt to elicit a response from the arroyo toads during nights during the breeding season, when temperatures are above 50°F, by spraying the suitable habitat areas inside the exclusionary fence with water to a depth of approximately one to two inches to simulate a rain event.

  - After the clearance surveys have been completed, daily clearance surveys will be conducted each morning prior to the continuation of construction activity. Any toads found will be translocated to areas, beyond the construction sites, identified prior to the initiation of construction activities in coordination with the Service.

- Designated Biologist will move arroyo toad out of harm's way to an undisturbed suitable habitat area beyond the construction site. The Designated Biologist will determine the best release location that includes similar habitat features to the capture site, to the greatest extent feasible. The Designated Biologist will not release toads if predators that may cause immediate harm to toads are observed.

- Capture methods will follow commonly accepted techniques for amphibian field sampling, including capture by hand (with wet hands), dip net, and pitfall trapping. All pitfall traps will be covered or removed when clearance surveys are not occurring.

- Amplexing pairs will not be captured, handled, or disturbed until amplexus is complete.

- To avoid transferring disease and pathogens between aquatic habitats, the Designated Biologist, Biological Monitors, and construction personnel will follow *The Declining Amphibian Task Force Fieldwork Code of Practice* (Declining Amphibian Task Force 1998) and *Recommended Equipment Decontamination Procedures* (USFWS 2005b), or as recommended by the USFWS at the time of project construction.

- The Designated Biologist will maintain a complete record of all arroyo toads encountered and moved out of harm's way during translocation. Records will include the date and time of capture, sex, physical dimensions, and coordinates/specific capture location will be recorded

and provided to the USFWS within 30 days of the completion of translocation. Monthly reports (including photographs of impact areas) will be submitted to the USFWS during construction activities within areas demarcated by arroyo toad exclusion fencing. The reports will include the duration of arroyo toad monitoring, the location of construction activities, the type of construction that occurred, and equipment used. These reports will specify numbers, locations, sex, observed behavior, and conservation measures employed to avoid, minimize, and mitigate impacts to arroyo toads. All field notes and other documentation generated by the Designated Biologist will be available upon request to the USFWS.

CM-ARTO-03: Implement Avoidance Measures for Arroyo Toad

The Authority will implement avoidance and minimization measures if arroyo toad are detected in upland or aquatic habitat within 500 feet of construction or maintenance activities, including:

- To the extent practicable, removal of arroyo toad riparian habitat will occur from October through December to minimize potential impacts to breeding adults and dispersing juveniles.

- Prior to vegetation removal and grading activities or other ground-disturbing activities, ESA fencing will be installed along the perimeter of the project footprint within or immediately adjacent to arroyo toad breeding and aestivation habitat. WEF will be installed under the supervision of the Designated Biologist or Biological Monitor and in accordance with CM-GEN-15 at least 14 days prior to construction or ground-disturbing activities.

- Where arroyo toads are present, exclusionary fencing will be installed at the boundary of the work area and will be at least 24 inches in height. No-work buffers will extend 50 feet beyond the WEF to the extent feasible to avoid and minimize impacts to arroyo toad outside of the work area during the construction period. The size of the no-work buffer may be adjusted by the Designated Biologist in coordination with the Authority and USFWS.

  - If construction activities in the non-disturbance exclusion zone cannot be avoided, the Designated Biologist will conduct a minimum of three nocturnal surveys to translocate arroyo toad to a suitable release site in accordance with CM-ARTO-02. If an individual(s) is observed on the final survey, the Designated Biologist will conduct additional nocturnal surveys until no arroyo toad are detected.

  - If arroyo toads are found in a work area where fencing was deemed unnecessary, work will cease until the Designated Biologist moves the individual(s) in accordance with CM-ARTO-02 and determines whether additional surveys or fencing are needed.

- The Designated Biologist or Biological Monitor will conduct daily clearance surveys in suitable habitat to ensure arroyo toad are absent from the work area. If arroyo toads are observed during the daily survey, CM-ARTO-02 will be implemented. Work activities that could cause disturbance, injury or mortality, will cease immediately.

- During project implementation, all workers will immediately inform the Biological Monitor if an amphibian is observed in or near project work areas. All work in the vicinity of the

animal which could cause disturbance, injury, or mortality will cease immediately and will not resume until the animal moves out of harm's way on its own or is moved in accordance with CM-ARTO-02.

- Construction and O&M activities will be scheduled to avoid rainfall events in areas in or near suitable habitat and when conditions conducive to amphibian movement persist (such as during or immediately after rain events). If work is to occur during these conditions, a Designated Biologist or Biological Monitor will survey the work areas prior to the start of work each day. To avoid and minimize impacts to arroyo toads, access road construction and use, with the exception of emergency situations, will occur during daylight hours (from two hours after sunrise to two hours before sunset) when amphibian movement is less frequent.

- Ground-disturbing activities within 500 feet of areas where arroyo toads may congregate (e.g., breeding pools) will be conducted outside the breeding season to the maximum extent practicable. These areas will be identified by the Designated Biologist prior to imitation of ground-disturbing activities.

- Prior to vehicle access, metal plates, bridges, or other structures will be placed over creeks and other wet areas if arroyo toad are documented within 500 feet of the work area.

- All fuels and components with hazardous materials or wastes will be handled in accordance with applicable regulations, the SWPPP prepared for CM-GEN-05, and the Construction Management Plan prepared for CM-GEN-06. These materials will be kept in segregated, secured and/or secondary containment facilities, as necessary. Any spills of liquid substances that could harm federally listed amphibians or their habitat will be immediately addressed in accordance with the Construction Management Plan prepared per CM-GEN-06.

- Herbicides and pesticides will be used minimally, applied in accordance with label instructions, and when wind velocities are nine miles per hour or less. Herbicide application on USFS lands will follow all current USFS guidelines and restrictions. Herbicide application will not occur during the breeding season. Soil binders proposed for use will be approved by USFWS for use in occupied areas prior to application.

CM-DT-01: Conduct Pre-construction Surveys for Desert Tortoise

Prior to the start of ground- or vegetation-disturbing activities, a Designated Biologist familiar with desert tortoise and their sign will conduct pre-construction surveys in modeled habitat for desert tortoise. The survey(s) shall be conducted in general accordance with the USFWS protocol *Preparing for Any Action That May Occur within the Range of the Mojave Desert Tortoise (Gopherus agassizii;* USFWS 2017) or current pre-project survey protocol. The survey(s) will occur no more than 48 hours before the start of ground- or vegetation-disturbing activity in modeled habitat for desert tortoise and may be conducted any time of year, but preferably during the desert tortoise active period (i.e., April through May and September through October when air temperatures are below 95°F). The survey will consist of transect surveys spaced no greater than 15 feet apart and will include a 50-foot buffer around the work area, where access is permitted. Results of the survey effort will be transmitted to the USFWS prior to the initiation of

ground- or vegetation-disturbing activities at the survey site. If desert tortoises are detected, the Authority will reinitate section 7 consultation with the USFWS.

CM-DT-02: Implement Avoidance Measures for Desert Tortoise

Following the pre-construction desert tortoise survey(s):

- Where construction activities will be of short duration (i.e., less than one month) in suitable tortoise habitat, full-time monitoring by a Biological Monitor with experience with desert tortoise may be used in lieu of fencing. In these situations, a daily pre-activity clearance sweep will be conducted by the Biological Monitor prior to start of daily construction activities.
- Where construction activities will occur for more than one consecutive month in suitable tortoise habitat:
  - A Biological Monitor with desert tortoise experience will be present during all construction activities.
  - Desert tortoise exclusionary fencing, barriers, and guards will be installed and maintained to avoid take of desert tortoise, including destruction of nests, or their potential habitat in the project footprint. ESA fencing and WEF in desert tortoise habitat will be constructed to standards outlined in *Desert Tortoise Field Manual* (USFWS 2009c) and will be used to delineate the area. The WEF will be maintained and monitored daily during the desert tortoise activity period (i.e., April through May and September through October when air temperatures are below 95°F) to ensure it is maintained in good condition, and to determine if tortoises are "trapped" along the fence searching for a way to access the other side. Outside of the desert tortoise active period, fence inspections will occur at least once weekly.
  - ESA fence and WEF design will incorporate shade protection structures consistent with guidance in *Shade Structures for Desert Tortoise Exclusion Fence: DRAFT Design Guidance. U.S. Fish and Wildlife Service, Palm Springs, California* (USFWS 2018).
- If any project vehicle must drive off established routes in suitable tortoise habitat, a Biological Monitor will walk immediately in front of the vehicle to search for desert tortoise. The Biological Monitor shall visually account for 100 percent of the footprint of the route or work location plus a 15-foot buffer on each side.
- During project implementation, all workers will immediately inform the Biological Monitor if a desert tortoise is observed in or near project work areas. All work in the vicinity of the animal which could cause disturbance, injury or mortality, will cease immediately.

CM-DT-03: Implement Avoidance Measures for Desert Tortoise Burrows

If active burrows are identified in the project footprint, if practical, and if PTE is granted, a 50-foot non-disturbance buffer will be established, maintained, and monitored. The buffer will be established by routing the ESA fence and WEF around the active burrows in a manner that allows for desert tortoise to leave the project footprint. Following the procedures and precautions outlined in the *Desert Tortoise Field Manual* (USFWS 2009c), all desert tortoise pallets and

burrows that are not practical to avoid will be examined and excavated by hand during the clearance survey by the Designated Biologist and collapsed to prevent re-entry.

CM-DT-04: Inspect Structures that Provide Potential Shelter for Desert Tortoise

Any construction pipe, culvert, or similar structure with a diameter greater than three inches that is stored less than eight inches aboveground, outside a fenced area of desert tortoise habitat, and left unattended for any time during period when the desert tortoise are active (i.e., early March through early June and September through early November) will be inspected for desert tortoise before the material is moved, buried, or capped. As an alternative, all such structures will be capped or placed on pipe racks.

CM-DT-05: Inspect under Vehicles in Desert Tortoise Habitat

Any time a vehicle or construction equipment is parked for more than 10 minutes outside of the fenced area, the ground under the vehicle will be inspected for the presence of desert tortoise before the vehicle/equipment is moved. If a desert tortoise is present, the vehicle/equipment will not be moved until the desert tortoise moves on its own away from the vehicle/equipment.

CM-DT-06: Installation of Desert Tortoise Guards

In occupied desert tortoise habitat and in areas of high vehicular construction traffic, desert tortoise guards that resemble cattle guards will be installed and connected to the exclusionary fencing at construction area entry points and permanent rail alignment maintenance access points to prohibit desert tortoise from crossing into the construction area right-of-way and alignment but still allowing the passage of construction vehicles. The desert tortoise guard will have a clear escape route away from construction activity for any desert tortoise that should fall into the guard. The guard will be inspected daily for desert tortoise and to ensure the escape route is free of obstruction. The guard will also be cleared of debris that may allow desert tortoise passage across the guard and out of construction area. The desert tortoise guard will be maintained throughout its use during the construction process by the Designated Biologist or Biological Monitor.

CM-DT-07: Implement Common Raven Avoidance Measures in Desert Tortoise Habitat

In desert tortoise habitat, measures will be implemented to ensure construction and O&M activities do not attract common ravens or other predators (e.g., coyotes) to the right-of-way by creating food or water subsidies, perch sites, roost sites, or nest sites. All activity work areas will be kept free of trash (including food waste) and debris. All trash will be covered, kept in self-closing sealable containers with lids that latch to prevent entry by wind, common ravens, and mammals, and removed from the project site at regular intervals and prior to periods when workers are not present at the site. Dead and injured wildlife found in the project footprint will be removed to reduce attraction of opportunistic predators. Dead and injured wildlife will be handled and removed in accordance with any applicable project permits and plans.

A Designated Biologist with knowledge of common raven identification (including nests) and desert tortoise remains (e.g., carcass, shell and bone fragments) will be approved by the USFWS. The Designated Biologist will survey for presence of common raven nests within 100 feet of the project facilities in occupied desert tortoise habitat. Inactive common raven nests will be removed if accessible and active nests will be reported to the USFWS for potential egg-oiling or

other control measures. Nest locations will be recorded using a GPS unit and mapped for future surveys to search for tortoise remains in proximity to the nests.

CM-Avian-01: Conduct Pre-construction Survey for Federally Listed Riparian Nesting Birds

Within 1 year prior to any ground- or vegetation-disturbing activity, the Designated Biologist will make an initial site visit to determine if suitable habitat for these species exists in the work area, plus a 500-foot buffer.

Where suitable habitat is present, the Designated Biologist will conduct protocol surveys for federally listed birds prior to ground- or vegetation-disturbing activities, adhering to guidance in:

- *Least Bell's Vireo Survey Guidelines* (USFWS 2001)
- *A Natural History Summary and Survey Protocol for the Southwestern Willow Flycatcher* (Sogge et al. 2010)

Following the surveys, the Designated Biologist(s) will conduct bi-monthly surveys (every two weeks) during construction activities that occur within 500 feet of suitable habitat during the nesting season for riparian nesting bird species or as required by the survey guidelines. If construction activities are subsequently halted or delayed by more than two weeks (14 days), during the nesting season for riparian nesting bird species, the Designated Biologist(s) will repeat surveys five days prior to the re-initiation of construction activities. Upon re-initiation of construction activities, the Designated Biologist will conduct the bi-monthly surveys. A survey report will be transmitted to the Authority prior to the initiation of ground- or vegetation-disturbing activities at the survey site.

CM-Avian-02: Implement Avoidance Measures for Federally Listed Riparian Nesting Birds

If a federally listed nesting bird or nest is detected within 500 feet of construction or maintenance activities, the Designated Biologist will establish a 500-foot no-work buffer around the individual or nest to the extent practicable. The Designated Biologist or Biological Monitor will have the authority to halt work if federally listed nesting birds exhibit distress and/or abnormal nesting behavior.

The no-work buffer will remain in place until the Designated Biologist has determined that the individual(s) has left the area, or the nest has failed or the young have fledged and are no longer reliant upon the nest site. The Designated Biologist will adjust the no-work buffer size and/or location to ensure that adults and young are not adversely by construction.

For construction activities involving the use of a helicopter, the nest buffer for federally listed nesting birds will be 500 feet horizontally and 500 feet vertically. Buffers will be measured from the location of the nest, regardless of where the nest is located.

CM-CAGN-01: Conduct Preconstruction Surveys for Coastal California Gnatcatcher

Prior to initiating any construction activities in suitable habitat of the work area plus 500 feet around the area, the Designated Biologist will conduct protocol surveys for gnatcatchers. Surveys will be completed prior to the start of project activities. If gnatcatchers are present, the

Designated Biologist will implement the following surveys during the breeding season and nonbreeding seasons.

- Prior to ground or vegetation disturbing activities during the breeding season (February 15 to August 30), the Designated Biologist will conduct nesting bird surveys for coastal California gnatcatcher in suitable coastal sage scrub habitat in accordance with the *Coastal California Gnatcatcher (Polioptila californica californica) Presence/Absence Survey Protocol* (USFWS 2019).
  - Surveys will be conducted no more than 10 days prior to the initiation of ground or vegetation disturbing activities or other construction activities within the suitable habitat of the work area and 500 feet surrounding the work area.
  - If an active nest is located, a 500-foot no-work buffer will be established around each nest site. The Designated Biologist may reduce the no-work buffer if it is determined that site specific project activities will not harm nesting gnatcatchers. The Designated Biologist will notify and confirm the proposed reduced no-work buffer with the USFWS. A Biological Monitor will monitor active nests during construction activities to ensure the nest and nesting activities are not disturbed. The Biological Monitor will have the authority to halt/suspend all activities until appropriate corrective measures have been completed.
- Prior to ground- or vegetation-disturbing activity during the non-breeding season (September 1 through February 14) in suitable habitat for coastal California gnatcatcher, the Designated Biologist will conduct a single-pass survey of each work area to determine if suitable habitat is occupied by the species.
  - If the habitat is occupied by gnatcatchers, the Designated Biologist will walk ahead of ground- or vegetation-removal equipment and ensure that gnatcatchers are not killed or injured as a direct result of the activities. The Designated Biologist will have the authority to halt/suspend all activities that could result in direct mortality or injury to gnatcatchers.

CM-CAGN-02: Implement Avoidance Measures for Coastal California Gnatcatcher

To the extent practicable, all ground or vegetation disturbing activities within occupied habitat of gnatcatcher will occur outside of the breeding season (September 1 to February 14). Occupied habitat is defined as the area within 500 feet of any gnatcatcher sighting.

During breeding and non-breeding seasons, a Designated Biologist will survey for gnatcatchers within 10 days prior to initiating any construction activities including vegetation or ground-disturbing activities. Results of the survey will be submitted to the USFWS for review prior to initiating any construction activities. The Biological Monitor will walk ahead of vegetation removal equipment and ensure that gnatcatchers are not killed or injured as a direct result of vegetation removal activities. The Biological Monitor will have the authority to halt/suspend all activities until appropriate corrective measures have been completed.

During the breeding season, no construction will take place within the 500-foot-no-work buffer zone around a nest site until the nest is no longer active, to the extent practicable. However, if construction must take place within the 500-foot buffer, the Designated Biologist will monitor

nesting activities to determine if the gnatcatchers are being disturbed. If the Designated Biologist determines that gnatcatchers are being disturbed (nesting habits or behavior change such as nest avoidance or change in feeding frequency), the Designated Biologist will have the authority to halt construction and will coordinate with the USFWS on measures to reduce disturbance to gnatcatchers, as needed. Measures may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nesting gnatcatchers and the activities, and working in other areas until the young have fledged.

CM-CAGN-03: Implement Mitigation for Impacts to Coastal California Gnatcatcher Suitable Habitat Prior to the Start of Construction

Impacts to coastal California gnatcatcher suitable habitat will be mitigated through a combination of on-site restoration, off-site acquisition, and off-site restoration and enhancement of suitable coastal California gnatcatcher habitat on existing protected lands (See Section 5.8 for mitigation details). The total acreage of gnatcatcher habitat conserved and/or restored will be 677 acres. Prior to the start of groundbreaking activities impacting coastal California gnatcatcher suitable habitat, the Authority will accomplish mitigation of 503.3 acres of suitable coastal California gnatcatcher habitat, of which 50 percent will be occupied. The remainder of the mitigation will be completed prior to completion of construction activities. Mitigation will be located primarily in the geographic area of the species' northeastern range. If the required amount of suitable mitigation habitat is not available in the northeastern extent of the species range, additional mitigation lands may be sought in the species range along the Santa Clara River west of I-5.

CM-CACO-01: Coordinate with USFWS on California Condor Locations

The Project Biologist will coordinate with USFWS at least seven days prior to initiation of construction activities (including vegetation removal) to review California condor tracking locations so that appropriate monitoring and avoidance measures can be determined. The Designated Biologist or Biological Monitor will continue to review California condor tracking locations daily, using available data or website managed by the USFWS for the purpose of implementing monitoring and avoidance measures.

CM-CACO-02: Monitor for California Condor

A Biological Monitor with avian experience will be present during construction activities occurring within two miles of where California condor have been observed, based on the most recent tracking and location information obtained from the USFWS prior to construction activities. The Biological Monitor shall have the ability to halt construction activities if a California condor enters the work area and may be affected by project activities (CM-CACO-05). Monitoring of the condor will continue until the condor has left the two-mile buffer area.

CM-CACO-03: Work Timing Restrictions Near California Condor Roosting Locations

If California condor are observed roosting within 0.5 mile of the construction area, no construction activity will occur between one hour before sunset and one hour after sunrise or until the Designated Biologist or Biological Monitor has determined that the bird(s) has left the

area. The Designated Biologist will review construction activities seven days prior to initiation of construction activities.

CM-CACO-04: Implement Avoidance Measures for California Condor Work Timing Restrictions Near California Condor Roosting Locations

During any ground-disturbing activities in the range of California condor, the Project Biologist will implement the following avoidance measures:

- Construction materials located in work areas, including items that could pose a risk of entanglement, such as ropes and cables, will be properly stored and secured when not in use.
- Litter, small artificial items (screws, washers, nuts, bolts, etc.), and all food waste will be stored in self-closing, sealable containers with lids that latch to prevent entry by wind, common ravens, and mammals. All trash receptacles will be regularly inspected and collected regularly; the contents disposed of from work areas on a daily basis to prevent spillage and maintain sanitary conditions. The receptacles will be removed from the project area when construction or O&M activities are complete.
- All fuels, fluids, and components with hazardous materials or wastes will be handled in accordance with applicable regulations. These materials will be kept in segregated, secured, and/or secondary containment facilities, as necessary. Any spills of liquid substances that could harm wildlife will be immediately addressed.
- Polychemical lines will not be used or stored on site to preclude wildlife, especially California condor, from obtaining and ingesting pieces of polychemical lines.

CM-CACO-05: Implement Helicopter Avoidance Measures for California Condor

The Project Biologist will coordinate with the USFWS, as appropriate, prior to helicopter use that could affect condor, to establish that no known individuals are in the project region. If condors are present, helicopter use shall be avoided until the birds have left the area. If condors are observed in helicopter construction areas, further helicopter use shall be avoided until the Designated Biologist or Biological Monitor has determined that the condors have left the area. The Designated Biologist and Biological Monitors will have radio contact with the project foreman, who will be in radio contact with the helicopter pilot. The biologist will provide real-time information updates to avoid conflicts with condors.

CM-CACO-06: Stop Work and Implement Hazing Methods for California Condor

If a California condor(s) lands or is observed in or near a work area, the Designated Biologist or Biological Monitor will assess the construction activities occurring and determine whether there is a potential hazard to the condor. Activities determined to be a potential hazard will be stopped until the condor has abandoned the area. After five minutes, if a condor has not left of its own volition, the Designated Biologist or Biological Monitor, or other USFWS-approved personnel, will implement USFWS-approved hazing methods in accordance with the USFWS Recovery Program's Guidance on Hazing California Condors (USFWS 2014c).

If the California condor does not leave the area within 30 minutes of the initiation of hazing, the Designated Biologist or Biological Monitor will notify the Project Biologist. The Project Biologist will coordinate with the Authority and USFWS to determine the appropriate actions.

CM-CACO-07: Implement Removal of Carrion that may Attract California Condor

Dead and injured wildlife found in the right-of-way and tracks will be removed during construction and O&M when the train is not in operation. During O&M within California condor range, automated security monitoring and track inspections will be used to detect fence failures and/or the presence of carrion in the right-of-way.

CM-OWL-01: Conduct Pre-construction Surveys for California Spotted Owl

Prior to any ground disturbing activity, the Project Biologist will conduct protocol-level surveys for California spotted owls within suitable habitat located in the work area and extending 500 feet from the boundary of the work area, where access is available. Surveys will be conducted in accordance with guidelines in the *Protocol for Surveying Proposed Management Activities that May Impact Northern Spotted Owls* (USFWS 2012), hence adapted for the California spotted owl.

CM-OWL-02: Work Timing Restrictions Near California Spotted Owl Occupied Site

If California spotted owls are within 0.5 mile of the construction area, no construction activity will occur between one hour before sunset and one hour after sunrise. The Designated Biologist will review construction activities seven days prior to initiation of construction activities.

CM-YBCU-01: Conduct Pre-construction Surveys and Implement Impact Avoidance for Yellow-billed Cuckoo

To ensure that yellow-billed cuckoo are not present at the time of construction, all suitable yellow-billed cuckoo modeled habitat within the project footprint will be surveyed prior to ground- or vegetation-disturbing activities during the months of June to September (Halterman et al. 2015). The survey(s) will be conducted by a Designated Biologist familiar with the distinguishing characteristics of the species and adhering to guidance in *A Natural History Summary and Survey Protocol for the Western Distinct Population Segment of Yellow-billed Cuckoo* (Halterman et al. 2015).

If yellow-billed cuckoos are observed, the Authority will reinitiate Section 7 consultation to coordinate with USFWS regarding avoidance measures.

CM-Light-01: Minimize Light Disturbance During Operations

Permanent project lighting will be of the lowest illumination necessary for safety and will be directed toward the facility and away from sensitive habitats. Light glare shields will be used to reduce the extent of illumination into sensitive habitats. The Authority will review the permanent lighting plans for the project and then submit them to the CFWO.

CM-Rest-01: Minimize Impacts to Listed Species During Maintenance of Restoration Areas

To minimize impacts to gnatcatchers during maintenance of restoration areas, the following measure will be implemented:

- If maintenance of a coastal sage scrub restoration area is necessary between February 15 and August 31, a qualified biologist with knowledge of the biology and ecology of gnatcatchers will survey for gnatcatchers within the restoration area, access paths to it,

and other areas susceptible to disturbances by site maintenance. Surveys will consist of three visits separated by 2 weeks starting March 1 of each maintenance/monitoring year. Work will be allowed to continue on the site during the survey period. However, if gnatcatchers are found during any of the visits, the Authority will notify and coordinate with the Service to identify measures to avoid and/or minimize effects to the gnatcatcher (e.g., nests and an appropriate buffer will be flagged by the biologist and avoided by the maintenance work).

To minimize impacts to vireos during maintenance of restoration areas, the following measure will be implemented:

- If maintenance of a riparian restoration area is necessary between March 15 and August 31, a qualified biologist with knowledge of the biology and ecology of vireos will survey for vireos within the restoration area, access paths to it, and other areas susceptible to disturbances by restoration site maintenance. Surveys will consist of three visits separated by 2 weeks starting April 10th of each maintenance/monitoring year. Restoration work will be allowed to continue on the site during the survey period. However, if vireos are found during any of the visits, the Designated Biologist will notify and coordinate with the Service to identify measures to avoid and/or minimize effects to the vireo (e.g., nests and an appropriate buffer will be flagged by the biologist and avoided by the maintenance work).

To minimize impacts to flycatchers during maintenance of restoration areas, the following measure will be implemented:

- If maintenance of a riparian restoration area is necessary between May 1 and September 15, a qualified biologist with knowledge of the biology and ecology of flycatchers will survey for flycatchers within the restoration area, access paths to it, and other areas susceptible to disturbances by restoration site maintenance. Surveys will consist of three visits separated by 2 weeks starting May 15th of each maintenance/monitoring year. Restoration work will be allowed to continue on the site during the survey period. However, if flycatchers are found during any of the visits, the Designated Biologist will notify and coordinate with the Service to identify measures to avoid and/or minimize effects to the flycatcher (e.g., nests and an appropriate buffer will be flagged by the biologist and avoided by the maintenance work).

To minimize impacts to arroyo toads during maintenance of restoration areas, the following measures will be implemented:

- If restoration maintenance work is necessary within or directly adjacent to suitable arroyo toad breeding habitat during the active season for the arroyo toad (March 1 to August 15), while water is flowing or has ponded in the area, the Designated Biologist will monitor potential arroyo toad breeding habitat to determine whether egg clutches, larvae, or juveniles are present. If eggs, larvae, or juvenile arroyo toads are found, restoration maintenance work will not occur in the area until signs of breeding are no longer evident.

- Restoration maintenance work during rain events will be avoided to the greatest extend feasible as arroyo toads may become active during rain events and work may result in sedimentation into breeding habitat. To ensure that restoration work is completed in a timely fashion, work may continue during a light or intermittent rain, if the Designated Biologist, using their best judgment, determines that increased impacts to arroyo toads are unlikely.

- All earth disturbing activities conducted for restoration work (e.g., irrigation repairs, replanting) where there is potential for the presence of aestivating arroyo toads (i.e., sandy, friable soils) will be monitored by the Designated Biologist who will ensure that impacts to arroyo toads are avoided to the greatest extent feasible by either: (1) Overseeing earth disturbing activities (e.g., excavation of planting basins, irrigation repairs) in potential aestivation areas and ensuring that hand tools are used to a depth of 1 foot such that arroyo toads are detected and salvaged if present; or (2) Conducting preconstruction translocation surveys and directing work away from observed arroyo toads, or relocating arroyo toads to suitable habitat away from the immediate work area.

- Transportation of materials for restoration maintenance work within suitable habitat will be conducted on foot, or with lightweight all-terrain vehicles and/or small gators with trailers. If possible, equipment used will have soft tires with minimal tread and a wide wheel base to better distribute weight and reduce soil disturbance. Vehicle speed will not exceed 15 miles per hour.

To minimize impacts to spineflower during maintenance of restoration areas, the following measures will be implemented:

- If maintenance of alluvial fan sage scrub habitat is necessary within or directly adjacent to suitable slender-horned spineflower habitat, a qualified biologist with knowledge of the biology and ecology of slender-horned spineflower will survey for spineflower within the restoration area, access paths to it, and other areas susceptible to disturbances by restoration site maintenance. Surveys will consist of three visits separated by 2 weeks starting April 15th of each maintenance/monitoring year. Restoration work will be allowed to continue on the site during the survey period. However, if spineflowers are found during any of the visits, the Designated Biologist will notify and coordinate with the Service to identify measures to avoid and/or minimize effects to the spineflower (e.g., an appropriate buffer will be flagged by the biologist and within this area weeding will be conducted by hand, and no herbicides will be used.)

CM-Mit-01: Mitigation Implementation

The Authority will offset project impacts with mitigation as quantified in Table 1. Prior to all vegetation removal and ground disturbing activities for the project, the Authority will provide a mitigation plan to the Service for review and approval. After the plan has been approved, and prior to all vegetation removal and ground disturbing activities for the project, the Authority will provide the following documentation to the Service:

- Documentation that the habitat has been conserved (e.g., documentation of purchase of bank credits or conservation easement). A perpetual biological conservation easement or other legal conservation mechanism acceptable to the Service will be recorded over the conservation areas restored and conserved by the project. The conservation mechanism will specify that no easements or activities (e.g., fuel modification zones, public trails, drainage facilities, walls, maintenance access roads, utility easements) that will result in soil disturbance and/or native vegetation removal will be allowed within the biological conservation easement areas. A draft conservation mechanism will be provided to the Service for review and approval. The Authority will also submit the final conservation mechanism to the Service.

- Documentation that funds for management of the conserved lands have been secured (e.g., documentation of purchase of bank credits or establishment of a non-wasting endowment). The Authority will prepare and implement a perpetual management, maintenance, and monitoring plan for the conservation areas restored and conserved by the project. The Authority will also establish non-wasting endowments for amounts approved by the Service based on Property Analysis Records (PAR) (Center for Natural Lands Management ©1998) or similar cost estimation methods, to secure the ongoing funding for the perpetual management, maintenance and monitoring of the property. The Authority will submit a draft long-term management plan for the property to the Service for review and approval. The long-term management plan will include, but not be limited to, the following: 1) the PAR or other cost estimation results for the non-wasting endowment; 2) proposed land manager's name, qualifications, business address, and contact information; 3) method of protecting the resources in perpetuity (e.g., conservation easement), monitoring schedule, measures to prevent human and exotic species encroachment, funding mechanism, and contingency measures should problems occur. The Authority will submit the final long-term management plan to the Service.

- Habitat restoration plans for all restoration, including both offsite and onsite/ temporary impact areas, will be submitted for review and approval at least 30 days prior to initiating project impacts. The plans will include:

    - All habitat restoration sites will be prepared for planting in a way that mimics natural habitat to the maximum extent practicable. All plantings will be installed in a way that mimics natural plant distribution and not in rows.

    - Planting palettes (plant species, size, and number/acre) and seed mixes (plant species and pounds/acre) will be limited to locally native species (e.g., species found in or near the biological study area for the project). The source location of all plant material and seed will be provided to the Service prior to use in restoration activities.

    - Container plant survival will be 80 percent of the initial plantings for the first 5 years. At the first and second anniversary of plant installation, all dead plants will

be replaced unless their function has been replaced by plants from seed or natural recruitment.

- A final implementation schedule will indicate when all impacts, as well as restoration planting and irrigation will begin and end.
- The final restoration plan will include 5 years of success criteria for restoration areas including: percent cover, evidence of natural recruitment of multiple species for all habitat types, 0 percent coverage for all woody California Invasive Plant Council's (Cal-IPC's) "Invasive Plant Inventory" species (e.g., trees and shrubs), and no more than 10 percent coverage for other exotic/weed species.
- A minimum 5 years of maintenance and monitoring of restoration areas, unless success criteria are met earlier and all artificial water supplies have been off for at least 2 years.
- A qualitative and quantitative vegetation monitoring plan with a map of proposed sampling locations. Photo points will be used for qualitative monitoring and stratified-random sampling will be used for all quantitative monitoring.
- Contingency measures in the event of restoration failure
- Annual mitigation maintenance and monitoring reports will be submitted to the Service no later than December 1 of each year.

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[9] The measures included in this biological opinion are a subset of all the measures that the Authority will implement. To avoid discrepancies in text, citations included in this appendix appear exactly as they do in the Authority's measures. For example, Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Sensitive Natural Communities is cited as "CDFW 2018b" even though there is not a "CDFW 2018a" in this appendix.

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