Natural Environment Study

Los Angeles and San Bernardino Counties

63-mile Connection Between

SR-14 and SR-18

District 7 & 8-LA & SB-New Highway

EA 2600U0/EFIS 0712000035

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Caltrans
CALIFORNIA DEPARTMENT OF TRANSPORTATION

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STATE OF CALIFORNIA

Department of Transportation

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Summary

This Natural Environment Study (NES) report serves to document the results of biological resource surveys, impact analysis, and proposed mitigation measures for a proposed project known as the High Desert Corridor (HDC). The project site is within the Mojave Desert located in Los Angeles and San Bernardino Counties.

Research and field studies in support of this document includes vegetation mapping, an inventory of all plants observed within the Biological Study Area (BSA), various wildlife surveys, wildlife movement study, and jurisdictional waters and wetlands determination and delineations. Early coordination occurred with resource agencies such as U.S. Fish and Wildlife Service (USFWS) and California Department of Fish and Wildlife (CDFW).

The BSA includes 36 different plant communities and land cover types, all of which would be impacted with the implementation of the proposed project. Designated Critical Habitat (DCH) for Southwestern willow flycatcher occurs within the Mojave River at all proposed crossing locations and would be an unavoidable impact with implementation of the project. Sign of Desert tortoise was observed in few locations in San Bernardino County and along with impacts to the DCH within the Mojave River a Biological Assessment was prepared and Consultation with USFWS, per Section 7 Endangered Species Act, was conducted and a Biological Opinion was issued. An Incidental Take Permit under Section 2081 of the California Endangered Species Act will also be necessary.

Impacts to jurisdictional waters and wetlands would occur within the Mojave River and therefore related permits from CDFW (1600), Regional Water Quality Control Board (401) and Army Corps of Engineers (404) would be necessary.

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List of Abbreviated Terms

AJD	Approved Jurisdictional Determination
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CWA	Clean Water Act
dbh	Diameter at breast height (~4 ft)
DCH	designated critical habitat
ESA	Endangered Species Act
FEMA	Federal Emergency Management Agency
FHWA	Federal Highway Administration
FGC	Fish and Game Code
Ft	foot/feet
HMMP	Habitat Mitigation and Monitoring Plan
IBA	Important Bird Area
km	kilometer(s)
KP	kilometer post
m	meter(s)
mi	mile(s)
NEPA	National Environmental Policy Act
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries
NMFS	National Marine Fisheries Service
OHWM	ordinary high water mark
PJD	Preliminary Jurisdictional Determination
PM	post mile
RWQCB	Regional Water Quality Control Board
SEA TAC	Significant Ecological Area Technical Advisory Committee
SWRCB	State Water Resources Control Board
USACE	United States Army Corps of Engineers
USFS	United States Forest Service
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WBWG	Western Bat Working Group
WEMO	Western Mojave Plan

Chapter 1. Introduction

This Natural Environment Study (NES) report serves to document the results of biological resource surveys, impact analysis, and proposed mitigation measures for a proposed project known as the High Desert Corridor (HDC) project. It is generally located in the Mojave Desert of Los Angeles and San Bernardino Counties and stretches 63 miles from the City of Palmdale in the west to the Town of Apple Valley in the east (Figure 1).

1.1. Project History

A new cross-desert E/W route located parallel and between Highway 58 and SR-138 has been under consideration and planning for many years, perhaps decades. As such, numerous alignments have been considered and most recently various elements and modes of travel have been considered and included. The reader will note in some technical studies additional areas have been included as part of the study area and not in others. This was due to the ever-changing proposed alignments and variations under consideration, and there were many. This document presents studies and analysis of the most current alignment and its variations. Should new areas not previously evaluated be included in the future, additional studies and analysis would be provided as an addendum to this report.

Purpose - The purpose of the proposed action is to improve east-west mobility through the High Desert region of southern California by addressing present and future travel demand and mobility needs within the Antelope and Victor valleys. The proposed action is intended to achieve the following objectives:

- Increase capacity of east-west transportation facilities to accommodate existing and future transportation demand.
- Improve travel safety and reliability within the High Desert region.
- Improve the regional goods movement network.
- Provide improved access and connectivity to regional transportation facilities, including airports and the existing and future passenger rail systems, including the proposed California HSR system and the proposed XpressWest HSR system.
- Contribute to state greenhouse gas (GHG) reduction goals through the use of green energy features.

Need - Lack of travel route continuity within the region contributes to traffic congestion and reduced level of service on adjoining highways and local streets. The existing travel through this corridor (SR-138) is increasingly unable to accommodate the existing and projected traffic demand attributed to residential growth and new commercial developments in the Antelope, Victor, and Apple Valley areas. This growth is resulting in inadequate capacity along the existing west-east roadways.

1.2. Project Description

This proposed project known as the HDC is to construct a new multimodal link between SR-14 in Los Angeles County and SR-18 in San Bernardino County. It would connect some of the fastest growing residential, commercial, and industrial areas in southern California, including the cities of Palmdale, Lancaster, Adelanto, Victorville, and the Town of Apple Valley. As currently planned, the project would be implemented in three segments: 1) Antelope Valley Segment – SR-14 to 100th Street East; 2) High Desert Segment – 100th Street East to US 395; and 3) Victor Valley Segment – US 395 to SR-18.

Recognizing the HDC as a multipurpose corridor with potential to connect to expanding regional rail system, the project would include a center-median HSR feeder service between Palmdale and Victorville. This feeder service would connect the XpressWest System, a planned HSR service from Victorville to Las Vegas, with Metrolink at the Palmdale Transportation Center (39000 Clock Tower Plaza Drive East) and potentially a planned future California HSR stop at Palmdale.

The continuing increases in the cost of energy, coupled with the trend to seek alternative means of energy production, clearly indicate the need to support the advancement of renewable energy technologies. In this regard, the HDC would be designed as a sustainable and environmentally responsible project. Based on results of the *Draft Green Energy Feasibility Study Report* (October 2012), technology that appears to be feasible for the HDC are solar installations near the necessary electric utility infrastructure.

Solar generation usually requires significant amounts of land or building roof space, and it is best suited for areas where energy does not have to travel far to connect with an existing utility transmission line. Solar installations may be installed as part of this project. Specific areas that may be suitable for this type of technology may be highway interchanges and/or utility substations. Solar lighting at interchange locations, at the on- and off- ramps, would conserve ROW needed and could be grid-free, not requiring any tie of hard wiring to an existing electric grid. Additional locations that may be considered are median barriers in the center of the HDC or solar panels mounted on soundwalls. Mounting solar panels at these locations would

not require additional ROW for the highway footprint. Solar panel installations may also be installed paralleled to the highway. These solar panels fields would have a maximum 100-foot width and be located along a maximum 20-mile length between two points. For more detailed information on renewable energy technologies that may be included as part of the HDC project please refer to Section 2.2.1 of the Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS).

The HDC Project would also include bicycle facilities, extending along the corridor from US 395 in Adelanto to the Palmdale Transportation Center. Coordination has been initiated to identify local routes for a bicycle connection to the master-planned bike routes within Adelanto and Palmdale.

Chapter 2. Study Methods

This chapter presents the numerous individual technical studies conducted, and rationale for methodology. The regulatory framework necessitating the various surveys is presented further below followed by a brief discussion of each survey and a summary table. For more detailed methodology information on each of the studies see the referenced appendices. The biological study area (BSA) boundary is defined below. See Figure 2 for a depiction of the BSA.

2.1. Study Area

The BSA was defined during development of the project purpose and need, and has been developed through a collaborative process between the transportation agencies (Caltrans, the Federal Highway Administration, Metro, Los Angeles and San Bernardino Counties). It is generally 500 feet in width over most of the 63-mile length with few exceptions at interchanges, intersections with on/off ramps, where the rail line and highway separate, and in few areas where the roadway narrows. The total area within the BSA is approximately 8,459 acres. It should be noted that the BSA differs for particular biological resources. For example, protocol desert tortoise surveys require zone of influence (ZOI) transect lines that extend beyond the limits of the project. In this scenario the BSA is considered to include all areas that are to be surveyed under protocol guidelines. For resource specific BSAs that extended beyond the general 500 feet width, the BSA often crossed private property where access was not granted. Therefore, the BSA was not completely surveyed for particular biological resources.

Four physical alignment variations in the alignment (A, B, D, and E) were developed to avoid particular features. These variations are described below:

- The Freeway/Expressway Alternative (four physical variations) would combine a controlled-access freeway and an expressway. The alignment will generally follow Avenue P-8 in Los Angeles County and just south of El Mirage Road in San Bernardino County, then extending east to Air Expressway Road near the I-15, and finally curving south and ending at Bear Valley Road.
    - Variation A – Near Palmdale, this segment is approximately 5 miles and is located within the City of Palmdale, the freeway/expressway would run slightly south of the main alignment, approximately between 15th Street East and Little Rock Wash. In this variation the alignment shifts varies from approximately 800 feet south at 15th street to 2190 feet south from the main alignment near 70th street and follows a Caltrans easement on Los Angeles

World Airport (LAWA) property. Right-of-Way required would be a 300 feet corridor for this portion.

- Variation B - East of the county line, this segment of Freeway/Expressway would flare out slightly south of the main alignment between Oasis Road and Coughlin Road, east of the Los Angeles/San Bernardino County Line. Variation B1 would be at the same location, but it would flare out a little less and pass through Krey Field.
- Variation D - Near Lake Los Angeles, the freeway/expressway would dip south of the main alignment, along Avenue R approximately between 190th Street East and 230th Street East. The alignment shift here reduces the amount of community (residential impacts).
- Variation E - Near Adelanto and Victorville, this freeway/expressway segment would dip south of the main alignment and the Victorville Federal Correctional Facility, just south of Rancho Road. This variation includes a separation of the High Speed Rail from the highway at the crossing of the Mojave River.

- The Freeway/Tollway Alternative would follow the same alignment as the Freeway/Expressway Alternative (including Variations A, B, D, and E), but the section between 100th Street East and US 395 would be operated as a tollway. When conducting impact analysis, the Freeway/Expressway Alternative and Freeway/Tollway Alternative are combined for ease of understanding and will read Freeway/Expressway (Freeway/Tollway) Alternative since both alternatives have the same project footprint; one simply is designated as a tollway.
- The Freeway/Expressway Alternative with High-Speed Rail (HSR) Feeder/Connector Service would be the same as the Freeway/Expressway Alternative, but with a HSR Feeder/Connector Service between the cities of Palmdale and Victorville. The HSR Feeder/Connector Service would utilize proven steel wheel-on-steel track technology with design and operating speeds of 180 miles per hour (mph) and 160 mph, respectively. This alternative includes two options regarding the Palmdale transportation center and are discussed below:
    - Option 1 – This option would shift the existing Palmdale Transportation Center south approximately 800 feet and would require a cut-and-cover box and mined tunnels configuration. This option would encroach into the Air Force Plant 42 parking lot associated with the Palmdale Airport. The alignment would also cross under commercial development at Rancho Vista Boulevard and 15th Street East. This option would diverge outside of

the HDC median and would require only two rail tracks to cross under the HDC westbound lanes, reducing the ROW needed for the HDC.

- Option 7 – This option would require a mix of aerial structures and tunneling, and it would allow the Palmdale Transportation Center to remain at its current location. This option would encroach into a small residential area near 10th Street East and would require a four-track section within the HDC median, necessitating a larger ROW section for the HDC in this area.

- The Freeway/Tollway Alternative with HSR Feeder/Connector Service would be the same as the Freeway/Tollway Alternative, but would include an HSR Feeder/Connector Service (as described above) between the cities of Palmdale and Victorville. This alternative also includes Option 1 and Option 7 as discussed above.
- The No Build Alternative would not provide new transportation infrastructure within the High Desert area to connect Los Angeles and San Bernardino Counties. Only existing SR-138 safety corridor improvements in Los Angeles County and SR-18 corridor improvements in San Bernardino County would be constructed.

As discussed in Section 1.2 of this document, the proposed project may also include solar panels to generate renewable green energy. The footprint of solar installations would be located entirely within the BSA. Solar installations would be installed paralleled to the highway along a maximum 20-mile length between two points and would have a general maximum width of 100 feet. Should the proposed project include these solar installations then it would convert an area that would otherwise be a temporary impact into a permanent impact. This would result in a maximum permanent impact of 242 acres for the renewable green energy element of this project. Appropriate environmental documentation will address these impacts as the project advances in the planning of this component.

The BSA includes the areas anticipated to be directly and indirectly affected by the proposed project. It should be highlighted that alignments and variations have changed over time since initial studies. Areas not previously studied were addressed in additional surveys and included in this analysis and report. As such, the reader should note there can be several supporting technical reports for any one topic discussed in this document.

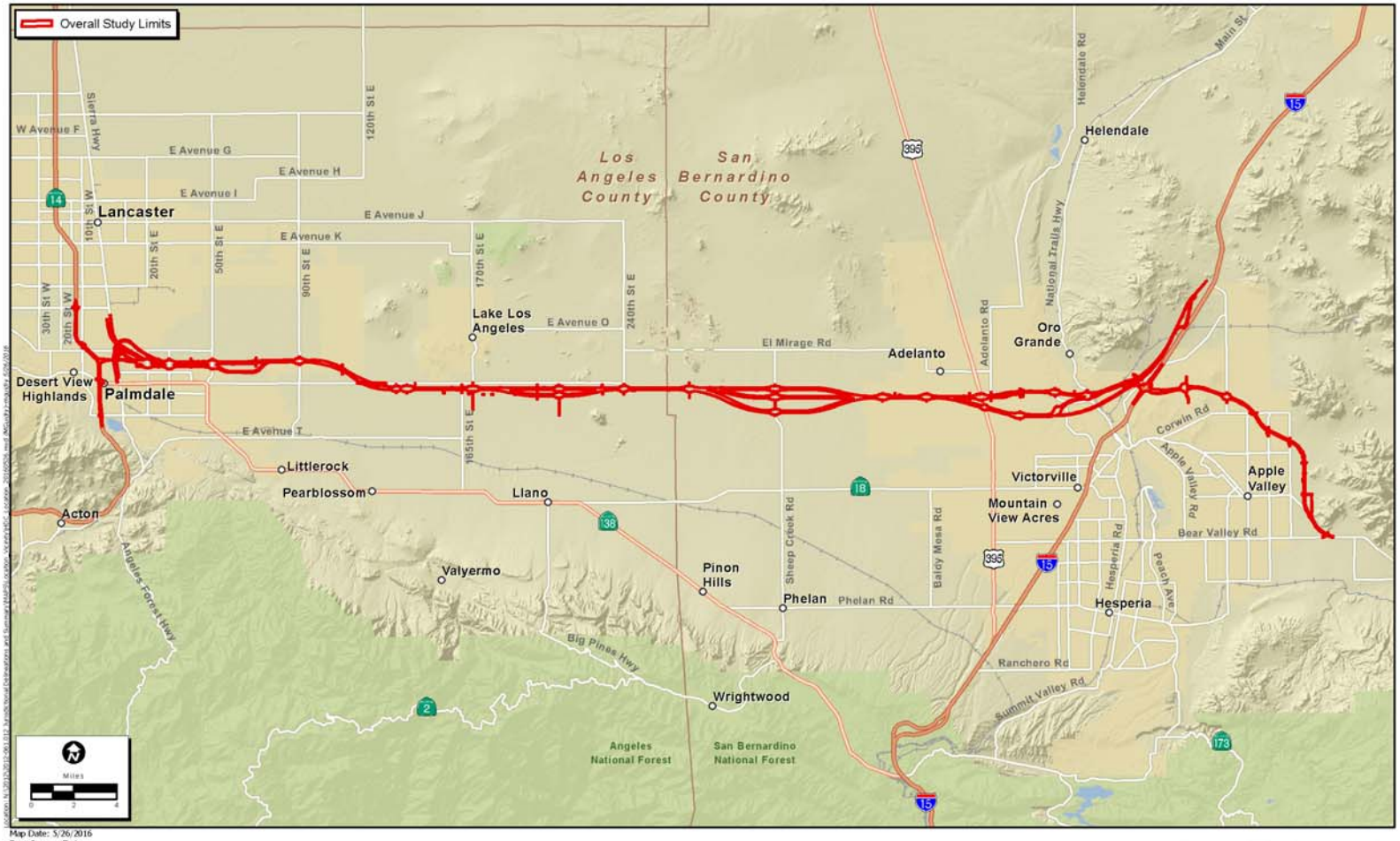

Figure 1. Project Location

Figure 2. Biological Study Area

2.2. Regulatory Requirements

The following federal, state, and local regulatory requirements are applicable for the proposed project.

2.2.1. Federal Regulations

2.2.1.1. NATIONAL ENVIRONMENTAL POLICY ACT

Under the National Environmental Policy Act (NEPA), it is the "continuing responsibility of the Federal Government to use all practicable means [to] utilize a systematic, interdisciplinary approach which will insure the integrated use of the natural and social sciences and the environmental design arts in planning and in decision making which may have an impact on man's environment." NEPA is triggered by any Federal action that may have an effect on the environment and Federal agencies "use the NEPA process to identify and assess the reasonable alternatives to proposed actions that will avoid or minimize adverse effects of these actions upon the quality of the human environment." (CFR 40, Parts 1500-1508)

2.2.1.2. ENDANGERED SPECIES ACT

Under provisions of Section 7(a)(2) of the Endangered Species Act (ESA), a Federal agency that permits, licenses, funds or otherwise authorizes a project activity must consult with the U.S. Fish and Wildlife Service (USFWS) to ensure that its actions would not jeopardize the continued existence of any listed species or destroy or adversely modify critical habitat. As such, focused surveys were conducted to determine absence/presence of any listed species with the potential to occur within the BSA for impact evaluation.

2.2.1.3. MIGRATORY BIRD TREATY ACT

The Migratory Bird Treaty Act (MBTA) (16 USC. 703-712), as amended, governs take, possession, import, export, transport, selling, purchasing or bartering of migratory birds, their eggs, parts and nests, except as authorized under a valid permit (50 CFR 21.11). The take of all migratory birds is governed by the MBTA's regulation of taking migratory birds for educational, scientific, and recreational purposes, and requiring harvests to be limited to levels that prevent over-utilization. Section 704 of the MBTA states that the Secretary of the Interior is authorized and directed to determine if, and by what means, the take of migratory birds should be allowed and to adopt suitable regulations permitting and governing take but ensuring that take is compatible with the protection of the species.

2.2.1.4. BALD AND GOLDEN EAGLE PROTECTION ACT

The Bald and Golden Eagle Protection Act (USC 668-668c), enacted in 1940 and amened several times since then, prohibits anyone, without a permit issued by the Secretary of the Interior, from “taking” bald eagles, including their parts, nests, or eggs. In addition to immediate impacts, this act also prohibits impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

2.2.1.5. CLEAN WATER ACT, SECTION 401 JURISDICTION

Section 401 of the Clean Water Act (CWA) is administered by the State Water Resources Control Board (SWRCB). Section 401 requires that any applicant for a federal permit for activities that involve a discharge to waters of the United States (WUS) shall provide the federal permitting agency a certification from the state in which the discharge is proposed that states that the discharge will comply with applicable provisions under the CWA. Section 401 Water Quality Certification is required for discharges to activities regulated by the U.S. Army Corps of Engineers (USACE) under Section 404. SWRCB jurisdiction typically matches the USACE jurisdictional boundaries for WUS mapped at the ordinary high water mark (OHWM).

2.2.1.6. CLEAN WATER ACT, SECTION 404 JURISDICTION

Section 404 of the CWA, which is administered by the USACE, regulates discharges of dredged or fill material into WUS. These waters include wetlands and non-wetland bodies of water that meet specific criteria, including a direct (through a tributary system linking a stream channel with traditional navigable waters used in interstate or foreign commerce) or indirect (through a nexus identified in the USACE regulations) connection to interstate commerce.

2.2.1.5.1. OHWM Non-Wetland Jurisdiction

Non-wetland WUS are non-tidal, perennial, and intermittent watercourses and tributaries to such watercourses (USACE 1986). The limit of USACE jurisdiction for non-tidal watercourses (without adjacent wetlands) is defined in 33 CFR 328.4(c)(1) as the OHWM. The OHWM is defined as the “line on the shore established by the fluctuations of water and indicated by physical characteristics including clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter, and debris, or other appropriate means that consider the characteristics of the surrounding areas” (USACE 1986). The bank-to-bank extent of the channel that contains the water-flow during a normal rainfall year generally serves as a good first approximation of the lateral limit of

USACE jurisdiction. The upstream limits of other WUS are defined as the point of where the OHWM is no longer perceptible. (ECORP 2013)

2.2.1.5.2. Three-Parameter Wetland Jurisdiction

Wetlands are "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (USACE 1986). To be determined a federal wetland, the following three criteria should be met:

- A majority (greater than 50 percent) of dominant vegetation species are wetland associated species;
- hydrologic conditions exist that result in periods of flooding, ponding, or saturation for at least 5 percent of the growing season; and,
- soils saturate, flood, or pond long enough during the growing season to develop anaerobic conditions in the upper part and should exhibit hydric soil characteristics indicative of permanent or periodic inundation.

Wetland vegetation is normally characterized by vegetation in which more than 50 percent of the cover of dominant plant species is composed of obligate wetland, facultative wetland, or facultative species that occur in wetlands. (ECORP 2013)

2.2.1.5.3. Solid Waste Agency of Northern Cook County versus U.S. Army Corps of Engineers

The aforementioned characteristics may not be apply to isolated, non-navigable waters (including vernal pools) pursuant to the January 9, 2001 Supreme Court decision in the case of Solid Waste Agency of Northern Cook County versus U.S. Army Corps of Engineers (SWANCC 2001). The SWANCC decision eliminated jurisdiction over isolated, intrastate, non-navigable WUS where the sole basis of jurisdiction is founded on the presence of migratory bird habitat. (ECORP 2013)

2.2.1.5.4. Rapanos v. United States and Carabell v. United States

USACE (2008a) will assert jurisdiction categorically and on a case-by-case basis, based on the court cases of *Rapanos v. United States* and *Carabell v. United States* over:

1. Traditional navigable waters (TNWs) and their adjacent wetlands;
2. Non-navigable tributaries of TNWs that are relatively permanent waters (RPWs) (e.g., tributaries that typically flow year-round or have a continuous flow at least seasonally) and wetlands that directly abut such tributaries (e.g., not separated by uplands, berm, dike, or similar feature); and,

3. Non-RPWs if determined (on a fact-specific analysis) to have a significant nexus with a TNW, including non-navigable tributaries that do not typically flow year round or have continuous flow at least seasonally, wetlands adjacent to such tributaries, and wetlands adjacent to but that do not directly abut a relatively permanent, non-navigable tributary. Absent a significant nexus, jurisdiction is lacking.

Of particular note is that RPWs do not include ephemeral tributaries, which flow only in response to precipitation, and intermittent streams, which do not typically flow year round or have continuous flow at least seasonally (e.g., typically three months). Determination of a significant nexus involves a functional analysis, and consideration of both hydrological and ecological factors for each tributary. (ECORP 2013)

2.2.1.7. EXECUTIVE ORDER 11990 FOR PROTECTION OF WETLANDS

Executive Order 11990 for the Protection of Wetlands (May 24, 1977) establishes a national policy to avoid adverse impacts on wetlands whenever there is a practicable alternative. On federally funded projects, impacts on wetlands must be identified in the environmental document. Alternatives that avoid wetlands must be considered. If wetland impacts cannot be avoided, then all practicable measures to minimize harm must be included. This must be documented in a specific “Wetlands Only Practicable Alternative Finding” in the final environmental document. An additional requirement is to provide early public involvement in projects affecting wetlands. The Federal Highway Administration (FHWA) provides technical assistance in meeting these criteria (FHWA Technical Advisory 6640.8A) and reviews environmental documents for compliance.

2.2.2. State of California Regulations

2.2.2.1. CALIFORNIA ENVIRONMENTAL QUALITY ACT

The California Environmental Quality Act (CEQA) requires that the significant environmental impacts of proposed projects or actions undertaken, funded, or requiring an issuance of a permit by a state or local agency are identified, government decision maker and the public are informed about the effects of those actions, and that steps are taken in order to avoid or mitigate those environmental impacts, if feasible.

2.2.2.2. CALIFORNIA ENDANGERED SPECIES ACT AND CALIFORNIA FISH AND GAME CODE § 2080 AND 2081

The California Endangered Species Act (CESA) is administered by the California Department of Fish and Wildlife (CDFW) and prohibits the “take” of plant and animal species identified as either threatened or endangered in the State of California by the

Fish and Game Commission. "Take" includes pursue, hunt, kill, or capture a listed species, or any other action that results in adverse impacts. Sections 2080 and 2081 of the California Fish and Game Code (FGC) allow the CDFW to authorize exceptions to the "take" of the State-listed threatened or endangered plant and animal species for purposes such as public and private development. State lead agencies are required to consult with CDFW to ensure that any actions undertaken by the lead agency are not likely to jeopardize the continued existence of any state-listed species or result in destruction or degradation of habitat.

2.2.2.3. CALIFORNIA FISH AND GAME CODE § 1600-1603

The State of California Code of Regulations empowers the CDFW to issue a Streambed Alteration Agreement under Section 1600-1603 of the FGC for any alteration of a river, stream, or lake where fish or wildlife resources may be substantially adversely affected. Streams (and rivers) are defined by the presence of a channel bed and banks, and at least an ephemeral flow of water. CDFW regulates wetland areas only to the extent that those wetlands are part of a river, stream or a lake as defined by CDFW.

CDFW has not defined wetlands for jurisdictional purposes. CDFW generally includes within the jurisdictional limits of streams and lakes any riparian habitat present. Riparian habitat includes willows, alders, and other vegetation typically associated with stream banks or lake shoreline. In most situations, wetlands associated with a stream or lake would fall within the limits of riparian habitat. Thus, defining the limits of CDFW jurisdiction based on riparian habitat will automatically include any wetland areas. Wetlands not associated with a lake, stream or other regulated areas generally are not subject to CDFW jurisdiction.

2.2.2.4. PORTER-COLOGNE WATER QUALITY CONTROL ACT

Pursuant to the Porter-Cologne Water Quality Control Act, California Water Code, Division 7 (Porter-Cologne), the SWRCB is granted ultimate authority over water quality policy for the State of California. The SWRCB/SWRCBs, oversee water quality at the local and regional levels, and regulate pollutant and nuisance discharges into Waters of the State of California (WSC). WSC are defined as any surface water or groundwater, including saline waters (Water Code 13050 (e)) within the boundaries of the state. Before allowing discharges that may affect the quality of WSC, a Report of Waste Discharge must be filed with SWRCB.

2.3. Regional Plans

2.3.1. Habitat Conservation Plans

The West Mojave Plan (WMP [United States Department of the Interior, Bureau of Land Management 2006]) consists of two components: a Federal Component that will amend the existing 1980 California Desert Conservation Area Plan (CDCA), and a Habitat Conservation Plan that will cover private lands. The West Mojave Plan is a regional habitat conservation plan amendment that (1) present a comprehensive strategy to conserve and protect the desert tortoise, the Mohave ground squirrel, and nearly 100 other sensitive plants and animals and the natural communities of which they are a part, and (2) provides a streamlined program for complying with the requirements of the CESA and FESA. On January 9, 2006, the USFWS finalized its Biological Opinion for the Federal portion of the West Mojave Plan, and on March 13, 2006, the BLM signed the Record of Decision for the Final Version of the West Mojave Plan. The private HCP component of the West Mojave Plan is still to be formulated and will include measures to meet the “fully mitigated” requirement of the CESA. The CDFW is currently working with local and county jurisdictions to develop conservation measures sufficient for the HCP to fulfill the fully mitigated requirement of the CESA. At the time of this writing, the West Mojave Plan has not been accepted by all entities.

2.3.2. County of Los Angeles

In the 1970’s the County of Los Angeles Department of Regional Planning set out to identify areas that are known to have significant ecological value. Studies were conducted and 115 Significant Ecological Areas (SEA) were identified and 65 areas were proposed for inclusion into the 1970 Environmental Development Guide. A Technical Advisory Committee (TAC) was then established to review proposed projects and their potential to impact any SEA. Recommendations are provided by SEA TAC to the county’s planning commission for their consideration prior to project approval. As part of the SEA TAC review process, two reports are prepared by a project proponent and presented to the SEA TAC for review and comment. At stage one, a Biota Report is prepared. This report describes the existing biological conditions of the SEA, the project, and vicinity. The second report prepared includes an analysis the proposed project would have on those existing conditions should the project receive approval. Based on the content of these reports, the SEA TAC makes their recommendations to the County Planning Commission.

This proposed project would impact SEA #48 Big Rock Wash, SEA # 49 Little Rock Wash and one additional proposed area in the Antelope Valley near the San Bernardino County Line according to the SEA boundaries originally established.

Since then, the Los Angeles County General Plan was updated (General Plan 2035) and includes SEA boundary and name changes. SEA #48 Big Rock Wash and SEA # 49 Little Rock Wash are now part of the newly named SEA titled Antelope Valley SEA and is described in the General Plan 2035. An excerpt taken the General Plan 2035 regarding the description and criteria used to include it follows:

2.3.3. Antelope Valley SEA

2.3.3.1. Boundary and Resources Description

The Antelope Valley SEA is located in the central portion of the Antelope Valley, primarily east of the cities of Palmdale and Lancaster, within a predominantly unincorporated area of the County. The SEA is focused on the principal watercourses of the area: Little Rock Wash and Big Rock Wash and tributaries, such as Mescal Creek. Audubon California recognizes the area of Edwards Air Force Base as a Globally Important Bird Area (IBA), which is visited by tens of thousands of migrant birds during the spring and fall migratory seasons, and supports the breeding of rare and endangered birds during the spring and summer months.

The SEA is located, at least partially, in each of the following United States Geological Survey (USGS) 7.5' California Quadrangles: Rosamond, Rosamond Lake, Redman, Rogers Lake South, Jackrabbit Hill, Lancaster East, Alpine Butte, Hi Vista, Adobe Mountain, Palmdale, Littlerock, Lovejoy Buttes, El Mirage, Pacifico Mountain, Juniper Hills, Valyermo, and Mescal Creek.

Watercourses and water features, such as dry lakes and springs, are the focus for desert wildlife and central to connectivity and biodiversity in this region. The SEA was delineated to emphasize the importance of the Little Rock Wash and Big Rock Wash watersheds to the surface and subsurface hydrology of the Antelope Valley and to the dry lakes. The western portion of the SEA extends along the margin of the Little Rock Wash and floodplain zone, while the eastern margin follows a tributary of Big Rock Wash, which is Mescal Creek Wash and its tributaries. The origins of the watercourses in the Angeles National Forest are an important aspect of their diversity and connectivity, and the importance of the diverse forest vegetation of this SEA is discussed below. The SEA includes several major buttes and numerous minor ones, which have highly diverse biota along with diverse desert habitats, which range from sand dunes formed from the wind-blown dust that the buttes collect, to rocky crags, which are home to various raptors. The SEA includes the County's portion of the watershed basin for dry lakes, which are the destination for the watercourses. There are three dry lakes and their adjacent plains (protected as part of Edwards Air Force Base) included in the SEA: Rosamond Dry Lake with the adjacent Piute Ponds, Buckhorn Lake, and Rogers Lake. These lakes and ponds are

often flooded during the rainy winter-spring seasons, and are the principal resting areas in the region on the Pacific Flyway. The northeastern portion of the SEA encompasses some agricultural cropland (portions of which are fallow) and dispersed rural residential uses; however, the underlying hydrology of the washes remains intact throughout the entire SEA.

Three main watercourse segments originate in the San Gabriel Mountains and flow through the Antelope Valley to dry lakes near the northern County boundary: 1) Little Rock Wash; 2) Big Rock Wash; and 3) Desert-Montane. Desert-Montane centers on Mescal Creek and includes adjacent drainages. The flows of all three drainages are subsurface for much of the year and may be on the surface during rain and snowmelt.

The Little Rock Wash segment (the westernmost segment), goes north from Little Rock-Palmdale Dam as its southern barrier. Upstream from the reservoir is critical habitat for the endangered arroyo toad (*Anaxyrus californicus* FE, SSC). The toad could occur from time to time in the downstream area of the SEA. Heading north to Mount Emma Road, the boundaries follow the flood zone of the Little Rock Wash and also incorporate some of the vegetated slopes that drain to the wash. North from Mount Emma Road, the boundaries generally follow Federal Emergency Management Agency (FEMA) boundaries. On the west side, south of Edwards Air Force Base and north of Avenue F, the SEA boundary follows the Economic Opportunity Area boundary.

All of Edwards Air Force Base that is in the County is included in the SEA because the restricted entry and use protect the dry lakes and their neighboring areas. Many desert plants and wildlife species once found broadly across the Antelope Valley are now found only or primarily within Edwards Air Force Base. The ponds and dry lakes have distributed habitat of marshy alkali grassland, alkali flats, and cattail and bulrush marsh augmented by wastewater treatment facilities that have additional ponds. Some of the nesting rare and uncommon birds include white-faced ibis (*Plegadis chihi*), tricolored blackbird (*Agelaius tricolor*), redhead (*Aythya americana*), gadwall (*Anas strepera*), yellow-headed blackbird (X*anthocephalus xanthocephalus*), least bittern (*Ixobrychus exilis*), and federally-threatened western snowy plover (*Charadrius alexandrinus nivosus*).

The Big Rock Wash area has western and eastern segments in the SEA. The western arm of the Big Rock Wash segment begins near the northern boundary of the Angeles National Forest, heads north out of the Forest along Pallett Creek. The SEA includes parts of Cruthers and Holmes creeks near their junctions with Pallett Creek. SEA boundaries follow the braided stream channel toward the confluence

with Big Rock Wash. From the aqueduct at Big Rock Wash to Edwards Air Force Base, the western boundary line follows recently active braids of Big Rock Wash, encompassing Alpine Butte, and joining to the Little Rock Wash segment within Edwards Air Force Base. On the eastern arm of the Big Rock Wash segment, the SEA boundaries head north from the Angeles National Forest headwaters of Dorr Canyon (a Big Rock Wash tributary) and the headwater area of Big Rock Wash near State Route-2. The boundaries travel through the Angeles National Forest and follow the wash area of the streams toward their confluence with Pallett Creek. The Angeles National Forest floodplain of the widened area of South Fork of Big Rock Wash is included in the SEA.

South Fork of Big Rock Wash is part of the federally-designated critical habitat of the mountain yellow-legged frog (*Rana muscosa*, FE, SE). This frog is known in the County from only a few high- mountain streams in the San Gabriel Mountains. A fungal pathogen is principally responsible for its decline; however, climate change, air pollution and non-native predators are also likely contributing factors.

Another broad area of the San Andreas Fault Zone near the Valyermo Ranch follows the FEMA boundaries and includes a nesting area for gray vireos near Bobs Gap. Between the Angeles National Forest and the aqueduct, the SEA boundaries follow FEMA boundaries. The eastern boundary generally follows the FEMA boundary and recently active braids along the main course of Big Rock Wash to the vicinity of Avenue Q East, at which point it projects east to encompass Lovejoy Buttes. At Avenue O, the eastern boundary rejoins the main active portion of Big Rock Wash, continuing northeastward to skirt development in Lake Los Angeles. In the vicinity of Avenue M, the boundary projects eastward from about 156th Street East to 180th Street East) to encompass Rocky, Piute, and Saddleback Buttes, and connect with the Desert-Montane transect segment.

The Desert-Montane Transect segment begins in the Angeles National Forest along the ridge of Table Mountain at the San Bernardino-Los Angeles County line. Table Mountain is known for its diverse flora, which includes desert and mountain elements, and some unusual limestone-obligate species. The SEA southern boundary along the ridgeline meets the western boundary as it skirts the camp developments along the southern base of Table Mountain. The boundary turns north along the western ridge of the Mescal Creek drainage, crossing the California Aqueduct with the State Route- 138. From the aqueduct to Avenue R, the western boundary buffers the westernmost portion of the drainage by 200 feet, protecting the braided area of the watercourse. This part of the SEA includes Black Butte and the Three Sisters Buttes, and many smaller unnamed buttes, as well as Mescal and Theodore Payne County wildlife sanctuaries. The east side of the transect is the San

Bernardino-Los Angeles County line. At about Avenue U East, the eastern boundary veers off the San Bernardino-Los Angeles County line to the north-northwest, buffering the Puzzle Creek watercourse by about 200 feet, protecting the braiding of the easternmost drainages. Near Avenue R, the boundary trends north, and goes north-northwest near Avenue P to include Moody Butte, lesser unnamed rises, and Blue Rock Butte.

The Desert-Montane segment largely avoids drainages that flow into and out of the Lake Los Angeles community, but the transect includes diffuse watercourses on the south side of Saddleback Butte, Saddleback Butte and the surrounding Saddleback Butte State Park, the Antelope Valley Indian Museum State Park at the base of Piute Butte, and Piute Butte. At about Avenue H and 170th Street East, the boundary turns to the northeast following natural vegetation to the County boundary near Avenue C. Here the boundary turns north along the line to where San Bernardino, Kern and Los Angeles counties meet. This northeastern part of the SEA has WEMO conservation areas for the threatened desert tortoise and state-threatened Mojave ground squirrel. The northeastern area has some BLM land and the County Phacelia Wildlife Sanctuary, which is also County Wildflower Preserve A. The SEA includes large parts of County Wildflower Preserve F.

On Edwards Air Force Base, north to south between Avenues B and E East, and west to east between 140th Street East and the San Bernardino-Los Angeles County line, there is federally- designated critical habitat for the state and federally-threatened desert tortoise (*Gopherus agassizii*). At 190th Street, the critical habitat widens to extend north beyond the County and the SEA into Kern County. At 200th Street, the critical habitat widens to the south to extend to Avenue H and then goes east across the San Bernardino-Los Angeles County line. The desert tortoise critical habitat area on Edwards Air Force Base is included in the SEA, and much of the SEA area north of Avenue H in the eastern drainages of the SEA is designated critical habitat for the tortoise.

The SEA traverses the Antelope Valley from the foothills of the San Gabriel Mountains, to the low elevations of the dry lake basins, and its expanse and considerable topographical relief is reflected in its relatively high floral and faunal diversity. The SEA includes playa lake, alkali marsh, alluvial fan scrub, a mosaic of xeric desert scrubs, Joshua tree woodland, desert riparian woodlands, juniper scrub, pinyon pine, chaparral and mixed conifer, oak, and riparian communities of higher elevations. Transitional zones (ecotones) between these communities often contain unusual species compositions, such as pinyon pine, juniper and Joshua trees together, or Joshua trees adjacent to cottonwood forest.

Edwards Air Force Base has the only good stands of mesquite (*Prosopis glandulosa*) remaining in the County. It has areas of Mojave spineflower (*Chorizanthe spinosa*), creosote bush scrub, alkali sink, and the transition vegetation between the two. Rosamond Lake has the best example of the shadscale scrub and alkali sink biotic communities in the County. Shadscale scrub needs heavy soil with underlying hardpan between 3000-6000 feet elevation, which is unusual in the County, and more common in the north Mojave Desert and Owens Valley. In addition, the playa has the southernmost extension of the Great Basin kangaroo rat (*Dipodomys microps*), which is an isolated geographic population of scientific interest.

The southernmost portions of the three “legs” of the SEA lie within the Angeles National Forest, and include the upper tributary watersheds and streams for Little Rock Wash, Big Rock Wash, and Mescal Creek. These areas support multi-species oak and conifer woodlands that are common to the middle-elevation zones on the north face of the San Gabriel Mountains. The creeks are higher energy systems at those elevations, as they collect water from the surrounding terrain, and are typically lined with woodlands of alder, willow, sycamore and cottonwood, with varying densities and with various compositions of species.

As the creeks drop north of the pressure ridges of the San Andreas Fault Zone, they lose gradient and widen, and most of the flow becomes sub-surface, except during high energy storms or in the spring (depending upon rainfall totals in the watersheds). The vegetation becomes sparser and less evenly distributed along the channel margins. Crossing the lowlands of the Antelope Valley, the channels support a variety of desert scrub vegetation within the alluvial plains. Where the alluvial plains are wide and shallow, cottonwood-willow woodland and sycamore woodland vegetation communities often occur within the overall floodplain on stable terraces; around oxbow flow zones in the Antelope Valley; or where the groundwater table is replaced or augmented by agricultural runoff. The surrounding upland habitats are primarily desert scrubs, including creosote and chenopod scrubs, sand sheets (chiefly around the buttes), and Joshua tree woodland. Intact Joshua tree woodland, with native understories present, supports a relatively high diversity of annual wildflowers, reptiles and mammals. The Joshua trees also provide nest sites for many resident and migratory bird species.

Lovejoy, Alpine, Piute, Black and Saddleback buttes, along with other, smaller unnamed buttes, form most of the topographical relief within the SEA. These areas offer different ecological conditions that are associated with rock shelter, perching sites, nesting sites, denning areas, wind protection and sand sheet accumulation areas. Local and migratory bat species roost and reproduce in the caves and

crevices of the butte formations. The higher buttes provide local nesting sites for owls and other birds of prey.

Alpine Butte is the least disturbed butte in the County, with excellent stands of Joshua tree woodland and creosote bush scrub, and impressive wildflower displays when rainfall creates appropriate conditions. Lovejoy Butte has Joshua tree woodland and creosote bush scrub, with a central wind-blown sand community for a good mixture of rock and sand habitats. In addition, the close proximity of Lovejoy Butte to Big Rock Wash increases the diversity of habitats in the area. Nevertheless, it also suffers from impact from the Lake Los Angeles community, which borders the butte on three sides. The clustering of buttes in the SEA may be important to the abundant, diverse wildlife that inhabits the various vegetation communities around and in the buttes. Saddleback Butte and Piute Butte together are protected as a state park, but Saddleback Butte is also subject to development for campsites and hiking trails. Piute Butte has a prehistoric site that may protect it from much future recreational development. All of the buttes harbor diverse wildlife and flora. Most of them are critical habitat for the state and federally-threatened desert tortoise. Some buttes within the desert tortoise's critical habitat are not included in the SEA.

The active and fallow open agricultural lands support a diversity of wildlife species, which essentially regard the fields and ditches as irrigated desert. Birds of prey frequently hunt over the open agricultural areas, including fallow fields; wide-ranging predators also find excellent hunting conditions in and around agricultural areas. A spectrum of local and migratory bat species feed over the irrigated fields in the spring and summer, when insect numbers are the highest, and at least one sensitive bat species, the pallid bat, forages in open scrub or ruderal desert habitats.

The northern portion of the SEA contains several unique habitat types, including mesquite bosque (threatened locally by lowering water tables and harvest for firewood), clay pan pools, vernal pools, alkali grasslands, alkali and freshwater marshes, and permanent ponds. Hundreds of bird species have been recorded from the pond and marsh habitats around the dry lakes and ponds, and numerous species nest on the playa margins or in the associated riparian habitats. The open creosote scrub and other xeric habitats on the slopes surrounding the lake playas serve as important wintering areas for many raptor species, as well as large numbers of songbirds.

2.3.3.2. WILDLIFE MOVEMENT

The SEA extends from the Angeles National Forest to the playa lakes within Edwards Air Force Base, encompassing most of the two largest drainages exiting the northern slope of the San Gabriel Mountain range. The geographical features of the

SEA serve as a major habitat linkage and movement corridor for all wildlife species within its vicinity and in an intergenerational sense, many of the plant species. Ecologically generalist species (mountain lion, bobcat, coyote, gray fox, etc.) have the ability to move across such vast areas and through changing habitat types. For such species, the SEA may serve as an important system for long-term and genetic exchange among populations. For smaller or less-mobile species or taxa, which are narrowly restricted in their habitat needs, the SEA can serve as a broad linkage zone, in which individual movement can take place during seasonal population dispersal or over generations. This provides essential genetic exchange within and between metapopulations. The two drainages, combined with the upland terrestrial Desert-Montane transect portion of the SEA, ensure linkage and direct movement areas for all of the wildlife species present within the County portion of the Antelope Valley.

2.3.3.3. REGIONAL BIOLOGICAL VALUE

The SEA meets several SEA designation criteria and supports many regional biological values. Each criterion and how it is met described below.

Table 1: Criteria Analysis of the Antelope Valley SEA

Criterion		Status	Justification
A)	The habitat of core populations of endangered or threatened plant or animal species.	Met	Critical habitat for the only known Antelope Valley population of the federally-endangered arroyo toad is adjacent to Little Rock Reservoir, upstream in Little Rock Creek, and some may still be found downstream of the dam in the SEA. The SEA encompasses much of the County ranges of the federally-threatened California desert tortoise, including much of the County critical habitat for the tortoise. The state-threatened Mohave ground squirrel occurs throughout much of the SEA. The SEA includes some of the critical habitat of mountain yellow-legged frog in the South Fork of Big Rock Creek. It includes habitat designated in the Western Mojave Plan (WEMO) for the alkali mariposa lily, which is a rare lily of the desert floor.
B)	On a regional basis, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The mesquite bosque, sand sheet, rocky butte, desert riparian woodland, and alluvial fan sage scrub habitats are unique and regionally restricted biotic communities encompassed by the SEA. Desert species not, or rarely, found elsewhere in the County, such as verdin, black-throated sparrow, Mojave rattlesnake, desert banded gecko, Leech's prionid borer, and mesquite borer, occur within these habitats. Additionally, the ponds and other riparian and wetland systems in the northern portion of the

Criterion		Status	Justification
			SEA support numerous water birds and raptors not found elsewhere in the County.
C)	Within the County, biotic communities, vegetative associations, and habitat of plant or animal species that are either unique or are restricted in distribution.	Met	The desert alluvial fan sage scrub, Joshua tree woodland, desert riparian woodland, mesquite bosque, alkali meadow/marsh, desert freshwater marsh, playa lake and seasonal pool habitats are located within, are unique to, or best represented within, the SEA.
D)	Habitat that at some point in the life cycle of a species or group of species, serves as concentrated breeding, feeding, resting, migrating grounds and is limited in availability either regionally or in the County.	Met	The freshwater habitats within and around Rosamond, Buckhorn and Rogers dry lake basins have large concentrations of migratory and resident waterfowl and birds of prey, providing them with essential seasonal and permanent resources. The rocky desert buttes are unique roosting, sheltering, perching and nesting sites for birds of prey and bats. This SEA is centered on migratory routes for both plants and animals along principal desert washes and buttes that connect the mountains to freshwater playas.
E)	Biotic resources that are of scientific interest because they are either an extreme in physical/geographical limitations, or represent unusual variation in a population or community.	Met	The mesquite bosque that is located within the SEA is clearly at an extreme of its geographical range, along with its associated biota, such as the mesquite borer. Edge populations usually represent an unusual genetic variation in a population or community, and therefore meet the criterion of scientific interest as well as the criterion of a population at the extreme physical/geographical limit of its range.
F)	Areas that would provide for the preservation of relatively undisturbed examples of the original natural biotic communities in the County.	Met	The SEA encompasses some of the most biotically intact acreages of Joshua tree woodland, desert riparian woodland, and desert alluvial fan sage scrub remaining in the County. Mesquite was formerly widely distributed in the Antelope Valley, but due to harvesting and drawdown of groundwater, is now limited to a few protected areas, such as the Edwards Air Force Base.

In conclusion, the area described is an SEA because it contains A) the habitat of core populations of endangered and threatened plant and animal species; B-C) biotic communities, vegetative associations, and habitat of plant and animal species that are either unique or are restricted in distribution in the County and regionally; D) concentrated breeding, feeding, resting, or migrating grounds, which are limited in availability in the County; E) populations of scientific interest at the edge of their range including the desert tortoise, the mesquite bosque, and the Mojave ground squirrel; and F) areas that provide for the preservation of relatively undisturbed examples of original natural biotic communities in the County.

Information required by SEA TAC in the form of their Biota Report and Impact Analysis Report is included in various locations throughout this Section 4 Biology, only in a different format. Because the County of Los Angeles Planning Commission does not have jurisdiction for approval of this proposed project, Caltrans submitted the DEIR/EIS to the County of Los Angeles for comment.

2.4. Studies Conducted

2.4.1. Literature Search

To determine the specific studies needed for this NES, sensitive biological resources with potential to occur within the proposed project area were identified through literature review, on-site field investigations, interviews with resource agency personnel through early coordination meetings, and input from experienced consultants and Caltrans' personnel. Databases and documents reviewed include the following:

- CDFW, Natural Diversity Data Base (NDDB). 2013. Rarefind 3 (Version 3.1.0-Dated 23 January 2013). The Resources Agency, Sacramento, California. 7.5 minute USGS Quadrangles – Adelanto, Apple Valley North, Apple Valley South, Baldy Mesa, Hesperia, Victorville (please see Appendix B).
- California Native Plant Society (CNPS). 2013. Inventory of Rare and Endangered Vascular Plants of California (online edition, v7-13). California Native Plant Society, Sacramento, California. 7.5 minute USGS Quadrangles – Adelanto, Apple Valley North, Apple Valley South, Baldy Mesa, Hesperia, Victorville.
- Soil Conservation Service, February 1986. Soil of San Bernardino County Mojave River Area. USDA, Washington, D.C.
- Soil Conservation Service, January 1970. Soil Survey Antelope Valley Area California. USDA, Washington, D.C.
- U.S. Fish and Wildlife Service. 2014. Information, Planning, and Conservation System (IPaC) (online edition). Los Angeles County, San Bernardino County.

2.4.2. Soils

One of the determining factors in distribution of native plants is soil type. Knowing the types of soil that occur within the study area helps in understanding potential locations of plant communities and potential for occurrence of special-status plants. Soil Conservation Service maps were reviewed for the area of the BSA. See Chapter 6. Literature Cited for soil map references.

2.4.3. Plant Communities and Plants

Plant community evaluation and mapping is typically the basis for determining potential presence for all other biological resources – special-status plants, wildlife, and jurisdictional waters. Caltrans' consultants AMEC and ECORP conducted initial mapping surveys in 2011 and 2012, respectively, and again by AMEC in 2012 in areas subsequently added. Caltrans' biologist Jeff Johnson mapped relatively small areas in 2013 and 2014 as the alignments and variations changed. As a result of continued design refinements, alignment shifts occurred. These areas were included in separate plant community reports and a map of these areas was included in DRAFT EIR/EIS Appendix C Plant Community Mapping Reports titled "Summary Plant Community Map".

Caltrans personnel Jeff Johnson and Andrew Johnstone, with the assistance of ECORP Consulting Inc., conducted plant community mapping with aerial imagery from 2010 for Los Angeles County and 2011 for San Bernardino County at 1-meter resolution and used at a scale from 1:500 to 1:800 to digitize plant communities using ArcGIS™. The imagery was analyzed during a preliminary desktop delineation effort to identify differences in vegetative cover. Areas that required further evaluation were viewed in the field on September 14th by biologists Jeff Johnson and Andrew Johnstone.

In response to comments on the 2015 DEIR/EIS, Caltrans' consultant ECORP Consulting consolidated the numerous plant community mapping efforts into one map set and one brief report for easier referencing. To minimize redundancy and reduce the size of this document, only this one consolidated report is included in the appendices. For the consolidated technical plant community study and map set refer to the technical report in Appendix C: Plant Community and Special-status Plant Surveys.

If the reader wishes to review any of the individual technical studies, those reports can be made available upon request.

Plant communities were classified consistent with "A Manual of California Vegetation" (Sawyer et al. 2009) and "List of Vegetation Alliances and Associations" (CDFG 2010). At times, specific areas did not conveniently fall within a described series, alliance, or association within these references, therefore, plant communities were assigned based on descriptions provided in these references.

Plant surveys were conducted with the intent to identify all plant species, common and special-status, occurring within the limits of the proposed project. Presence or absence of all special-status plant species with potential to occur within the project

vicinity was a special focus. Prior to field surveys, a review of available databases and reports was conducted to identify special-status species that occur within the region of the proposed project. Based on literature and database review, a list of potentially occurring special-status plant species was prepared. Special-status plants are those that are considered rare, threatened, or endangered within the state or region by local, state, or federal resource conservation agencies and the California Native Plant Society.

Qualified personnel surveyed the BSA on foot during the time of year for optimal detection. Survey protocol following methods described in “Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities” (CDFG 2009) was followed. Refer to the consolidated focused technical study in Appendix C for more specific survey methodology.

Impacts to plant communities were calculated by overlaying project impact limit lines onto plant community data layers using GIS. Impacts were categorized into permanent and temporary impacts. Permanent impacts are areas located within the permanent facility footprint including the adjacent road shoulders which would be maintained. Adjacent areas within the Caltrans ROW, which will be revegetated, are considered to be temporary impact areas.

2.4.4. Desert Tortoise

Portions of the proposed project site are located within the known historic range of the Desert tortoise. As such, focused USFWS protocol surveys were conducted to determine absence/presence in 2011, 2012 and 2013. Field work was performed by a team of Caltrans’ biologists lead by ECORP Consulting biologist Kristen Mobraaten or Brad Haley. In response to comments on the 2015 DEIR/EIS, Caltrans’ consultant ECORP Consulting consolidated the focused desert tortoise surveys into one map set and one brief report for easier referencing. To minimize redundancy and reduce the size of this document, only this one consolidated report is included in the appendices. For specific information regarding methodology of this consolidated report see Appendix D: Desert Tortoise Surveys. If the reader wishes to review any of the individual technical studies, those reports can be made available upon request.

2.4.5. Mohave Ground Squirrel

The proposed project site is located within the known historic range of the Mohave ground squirrel. As such, a habitat assessment was conducted on the entire BSA by Dr. Phil Leitner to determine areas suitable for Mohave ground squirrel (MGS). Four categories of habitat suitability were recognized: Unsuitable, Low Suitability, Medium

Suitability, and High Suitability. Detailed descriptions of Dr. Leitner's methods and definitions of suitability categories can be found in Appendix E: Mohave Ground Squirrel Survey. The purpose of this study was to help guide locations of focused surveys and if individuals were found help in defining boundaries of habitat suitability.

2.4.6. Burrowing Owl

The proposed project site is located within the known historic range of the Burrowing owl. As such, a habitat assessment was conducted on the entire BSA by AMEC Earth & Environmental in 2011, ECORP Environmental Consulting in 2012, and by Caltrans' biologist Jeff Johnson in 2013 to determine areas suitable for Burrowing owl. In response to comments on the 2015 DEIR/EIS, Caltrans' consultant ECORP Consulting consolidated the focused burrowing owl surveys into one map set and one brief report for easier referencing. To minimize redundancy and reduce the size of this document, only this one consolidated report is included in the appendices. For specific information regarding methodology of this consolidated report see Appendix F: Burrowing Owl Habitat Assessment Survey. If the reader wishes to review any of the individual technical studies, those reports can be made available upon request.

2.4.7. Least Bell's Vireo and Southwestern Willow Flycatcher

The proposed project site is located within the known historic range of the Least Bell's vireo and Southwestern willow flycatcher. During initial site visits by Caltrans biologist Jeff Johnson in 2010 and early 2011, potentially suitable habitat was observed within the Mojave River. Because suitable habitat was observed, focused protocol presence/absence surveys were conducted in 2012, 2013, 2014, and 2015. In response to comments on the 2015 DEIR/EIS, Caltrans' consultant ECORP Consulting consolidated the focused burrowing owl surveys into one map set and one brief report for easier referencing. To minimize redundancy and reduce the size of this document, only this one consolidated report is included in the appendices. For specific information regarding methodology of this consolidated report see Appendix G: Least Bell's Vireo and Southwestern Willow Flycatcher Survey. If the reader wishes to review any of the individual technical studies, those reports can be made available upon request. For specific information regarding survey methodology refer to technical reports in

2.4.8. Wildlife Movement

Wildlife movement studies were conducted along the BSA to help understand the use of the proposed project site by traveling wildlife, and perhaps to identify movement corridors should they exist. While many factors are considered in determining functionality of a movement corridor, such as physical characteristics,

quality, the use of such corridor by any one of several taxonomic groups (plants, invertebrates, reptiles, birds, mammals), typically target species of such study focus on the movement of medium (fox, coyote, bobcat) and large (deer, sheep, mountain lion, bear) mammals as an indicator. Methods of detecting wildlife movement included nighttime spotlighting, tracking stations, and motion sensor camera stations.

Separate studies were conducted by Caltrans consultants for each Los Angeles County and San Bernardino County portions of the proposed project due to contracting policies. In response to a comment on the 2015 DEIR/EIS, a separate focused study was conducted on an area east of the terminus of the proposed project that could potentially be affected should this project be implemented.

Caltrans' consultant ECORP Consulting consolidated these three studies into one map set and one brief report for easier referencing. To minimize redundancy and reduce the size of this document, only this one consolidated report is included in the appendices. For specific information regarding methodology of this consolidated report see Appendix H: Wildlife Corridor Evaluations. If the reader wishes to review any of the individual technical studies, those reports can be made available upon request.

In response to a comment received during the scoping period, particular attention was given to searching for evidence of a bobcat (*Lynx rufus*) nursery site located near Lake Los Angeles. This search effort was part of every study conducted in the vicinity of Lake Los Angeles. Results relating to potential bobcat nursery sites are addressed in the section addressing Common Wildlife.

2.4.9. Jurisdictional Delineation

Several jurisdictional delineation (JD) reports were developed to accommodate design changes and alignment variations within the entire BSA (Appendix I; AMEC 2012; ICF 2012; ECORP 2013). These preliminary JD results were conducted according to the methods outlined in the USACE reference manuals (1987, 2005, 2008b, 2008c). These results were further analyzed by Caltrans biologists Jeff Johnson and Mary Ngo using the following resources:

- Project plans of the alignment footprints and permanent impact areas
- Aerial imagery (CTEarth 2014)
- Review of USACE literature (SWANCC 2001; USACE 2008a)
- Flood Maps FEMA 2008a, 2008b, 2008c, 2008d, 2008e, 2008f)
- Topographic maps (USGS 2012a, 2012b, 2012c, 2012d)

- U.S. Fish and Wildlife Service National Wetlands Inventory (USFWS 2014)
- USACE approved jurisdictional determinations of nearby projects
- Consultation with USACE

To determine the estimated acreages of jurisdictional features, the widest permanent impact area of the variations were factored into the calculations. These acreages should be considered preliminary until designs are finalized and jurisdiction is verified by USACE, RWQCB, and CDFW.

Due to design refinements, alignment shifts have occurred. These areas were included in a separate jurisdictional delineation and a map of these areas is included in Appendix I Jurisdictional Reports titled “Summary Jurisdictional Delineation Map”. Because these areas were evaluated using aerial photographs and briefly verified in the field, no report is provided. A brief methodology is described below.

Caltrans personnel Jeff Johnson and Mary Ngo, with the assistance of ECORP Consulting Inc., conducted a jurisdictional delineation through the use of aerial imagery from 2010 for Los Angeles County and 2011 for San Bernardino County at 1-meter resolution and used at a scale from 1:500 to 1:800 to digitize potential jurisdictional features using ArcGIS™. The imagery was analyzed during a preliminary desktop delineation effort to identify differences in vegetative cover, the presence of breaks in a slope, and other areas of potential water disturbance (USACE 2008a). The aerial imagery, combined with these other resources, was used to create a map with potentially jurisdictional features. Areas that required further evaluation were viewed in the field on September 14th by Caltrans biologists Jeff Johnson and Andrew Johnstone.

2.5. Personnel and Survey Dates

A summary of studies conducted, dates, and personnel or consultant firm is presented below in Table 2. Biological Studies Summary. Caltrans’ biologist Jeff Johnson conducted Initial site visits on October 11, 2009, February 28, 2010, November 18, 2010, and January 7, 2011. Follow-up site visits by Mr. Johnson were conducted on June 3, 2012, September 23 and 24, 2012, March 23, 2013, October 29, 2013, December 7, 8, 17, 22, 2013, and January 5-7, 2014 for a total of 104 hours. Additional Caltrans’ biologists assisting Mr. Johnson were: Sarah Baker, Eric Hanson, Andrew Johnstone, Mary Ngo, and Christopher Stevenson. Resumes for each are included in Appendix J – Resumes. Specific dates and personnel for specialized technical studies can be found in Appendix B-H.

Table 2: Biological Studies Summary

Study Type	Title	Date	Area of Coverage	Personnel
General Biological Surveys	Biological Survey Results Report for the State Route 138 New Freeway Construction Project	April 2012	Los Angeles County	ECORP Consulting
Acoustic Bat Surveys	Acoustic Bat Survey Report	August 2015	Mojave River	Caltrans
Plant Survey	Spring 2011 Rare Plant Species Survey	September 2011	San Bernardino County	AMEC
Plant Survey	2011 Special Status Plant Survey Report	August 2012	Los Angeles County	ICF International
Plant Survey	Updated Plant Community Mapping Report	August 2012	San Bernardino County	AMEC
Plant Survey	Spring 2015 Rare Plant Species Survey	October 2015	BSA (Los Angeles and San Bernardino Counties)	ECORP Consulting
Wildlife Movement	Preliminary Wildlife Corridor Evaluation	23 September 2011	San Bernardino County	AMEC
Wildlife Movement	Preliminary Wildlife Corridor Evaluation	28 August 2012	San Bernardino County	AMEC
Wildlife Movement	Wildlife Crossing Study Results Report	August 2012	Los Angeles County	ECORP Consulting
Desert Tortoise	Focused Desert Tortoise Survey and Burrowing Owl Habitat Assessment Results	2011	Los Angeles County – East	ECORP
Desert Tortoise	High Desert Corridor Focused Desert Tortoise Survey, SR-18 to LA County Line	September 2011	San Bernardino County	AMEC
Desert Tortoise	High Desert Corridor Focused Desert Tortoise Survey, SR-18 to LA County Line	August 2012	San Bernardino County	AMEC
Desert Tortoise	Biological Survey Results Report for SR-138 New Freeway	2012	Los Angeles County – West	ECORP
Desert Tortoise	2013 Focused Desert Tortoise Survey High Desert Corridor	2013	San Bernardino County	ECORP
Desert Tortoise	Desert Tortoise Survey	June 2014	San Bernardino County	Caltrans – Sarah Baker ECORP – Brad Haley, Kristen Mobraaten

Study Type	Title	Date	Area of Coverage	Personnel
Southwestern Willow Flycatcher and Least Bell's Vireo	2012 Southwestern Willow Flycatcher and Least Bell's Vireo Surveys	August 2012	Mojave River	ECORP Consulting
Southwestern Willow Flycatcher and Least Bell's Vireo	2013 Southwestern Willow Flycatcher and Least Bell's Vireo Surveys	August 2013	Mojave River	ECORP Consulting
Southwestern Willow Flycatcher and Least Bell's Vireo	2014 Southwestern Willow Flycatcher and Least Bell's Vireo Surveys	2014	Mojave River	ECORP Consulting
Southwestern Willow Flycatcher, Least Bell's Vireo and Yellow-billed Cuckoo	2015 Southwestern Willow Flycatcher, Least Bell's Vireo and Yellow-billed Cuckoo Surveys	2015	Mojave River	ECORP Consulting
Burrowing Owl Habitat Assessment	2011 Habitat Assessment for Burrowing Owl	September 2011	San Bernardino County	AMEC
Burrowing Owl Survey and Habitat Assessment	Focused Desert Tortoise Survey and Burrowing Owl Habitat Assessment Results	2011	Los Angeles County - East	ECORP
Burrowing Owl Habitat Assessment	2012 Burrowing Owl (*Athene cunicularia)* Habitat Assessment Report	September 2012	San Bernardino County	AMEC
Burrowing Owl Survey and Habitat Assessment	Biological Survey Results Report for SR-138 New Freeway	2012	Los Angeles County - West	ECORP
Burrowing Owl Focused Survey	Burrowing Owl Focused Survey Results	2015	BSA	Caltrans
MGS Focused Survey	Trapping for Mohave Ground Squirrel	27 July 2011	San Bernardino County	LSA
Mohave Ground Squirrel Habitat Assessment	Mohave Ground Squirrel Habitat Assessment	30 December 2011	San Bernardino County	AMEC
MGS Focused Survey	Trapping for Mohave Ground Squirrel	27 May 2014	Los Angeles and San Bernardino Counties	Caltrans – Mr. Jeff Johnson
Jurisdictional	Jurisdictional Delineation:	February	City of Palmdale,	ECORP

Study Type	Title	Date	Area of Coverage	Personnel
Delineation	SR-138 New Freeway Construction Project Area	2010	Los Angeles County	Consulting, Inc.
Jurisdictional Delineation	High Desert Corridor Project: Delineation of Jurisdictional Waters	June 2012	San Bernardino County	AMEC Environment & Infrastructure, Inc.
Jurisdictional Delineation	Preliminary Jurisdictional Delineation Report: High Desert Corridor	November 2012	Los Angeles County	ICF International
Jurisdictional Delineation	Jurisdictional Delineation for the Updated High Desert Corridor Alternative Alignment Areas	October 2013	City of Palmdale to the Town of Apple Valley: Los Angeles and San Bernardino Counties	ECORP Consulting, Inc.
Jurisdictional Delineation	Summary Jurisdictional Delineation Map	September 2014	Los Angeles and San Bernardino Counties	Caltrans/ ECORP Consulting, Inc.
Jurisdictional Delineation	Preliminary Impact Assessment of Federal Jurisdictional Resources for the High Desert Corridor Project	October 2015	Los Angeles and San Bernardino Counties	ECORP Consulting, Inc.
Jurisdictional Delineation	Preliminary Impact Assessment of State Jurisdictional Resources for the High Desert Corridor Project	October 2015	Los Angeles and San Bernardino Counties	ECORP Consulting, Inc.
State Jurisdictional Delineation Maps	Consolidation of Jurisdictional Delineation Studies	October 2015	Los Angeles and San Bernardino Counties	ECORP Consulting, Inc.
Federal Jurisdictional Delineation Maps	Jurisdictional Delineation Impact Summary Map	October 2015	Los Angeles and San Bernardino Counties	ECORP Consulting, Inc.

2.6. Agency Coordination and Professional Contacts

Numerous early coordination meetings occurred between Caltrans and resource agencies such as U.S. Fish and Wildlife Service, CA Department of Fish and Wildlife, and Army Corps of Engineers. In general, the purpose of these meetings was to provide agency personnel with the latest project design information, proposed approaches to survey protocol, impact analysis, and to evaluate potential mitigation measure potential. Agency's input was helpful with regard to all of these topics, especially design criteria, survey protocol, and impact analysis.

On 19 October 2010 Caltrans (Paul Caron and Jeff Johnson) met with CDFW (Jamie Jackson, Eric Weiss, and Scott Harris to present project alignment and discuss

survey needs. Caltrans and CDFW also met in June 2011 and February 2012 to discuss changes to the alignment and potential impacts to special-status species. In March 2013 Caltrans personnel (Paul Caron and Jeff Johnson) met with CDFW (Jamie Jackson) and FWS (Ray Bransfield) in the FWS Ventura Office to specifically discuss survey needs, impact analysis and potential mitigation measures for Desert tortoise and Southwestern willow flycatcher. Mr. Johnson provided a map to Mr. Bransfield of the studies being conducted with preliminary results, the project map, their approach to surveys, and additional surveys that were added because of alignment changes. Mr. Bransfield was notified that Caltrans plans to have BA and BO issued before the Final Environmental Document is submitted, while the CDFW ITP and 1600 permit will not be requested until after the Final Environmental Document is submitted. On July 17, 2015, Caltrans biologists (Mr. Johnson and Andrew Johnstone) and ECORP Consulting biologists (Don Mitchell and Brad Haley) had a conference call with Mr. Bransfield to discuss effect determination, potential mitigation measures, desert tortoise density calculations, and results of studies to date. An additional meeting occurred with CDFW (Becky Jones) in April 2013 to further discuss Desert tortoise survey needs, impact analysis, design criteria, and mitigation measures. Numerous telephone conversations occurred between Caltrans, Jeff Johnson, and CDFW Jamie Jackson during 2011-2013 to discuss project alignment shifts, survey results, and to request input on culvert design with regard to wildlife crossing.

Another meeting with California Department of Fish & Wildlife occurred on August 6, 2015. Attendees were: CA Dept of Fish & Wildlife - Ms. Jaime Jackson, Ms. Kelly Schmoker, Ms. Rebecca Jones, Mr. Scott Harris, ECORP Consulting – Ms. Kristen Wasz, and Caltrans – Mr. Jeff Johnson, Mr. Andrew Johnstone. During this meeting the following topics were discussed: Impact analysis and potential mitigation measures for Desert tortoise, in particular potential relocation action plan should a tortoise need relocation; design plans now include a wildlife overcrossing of the rail near east terminus, and impacts to wildlife movement. Broader mitigation approach was presented by Mr. Johnson to include the development of a Habitat Mitigation and Monitoring Plan addressing all impacts. California Department of Fish & Wildlife expressed an interest in having the entire roadway elevated to prevent or reduce impacts to wildlife. A similar request was previously made by CDFW to have the entire roadway within a tunnel.

A Biological Assessment was prepared and submitted to the U.S. Fish & Wildlife Service on August 14, 2015 for their preparation of a Biological Opinion. Formal Consultation was initiated September 16, 2015. As such, we anticipate formal consultation to conclude on or before December 15, 2015 and a complete Biological Opinion on or before January 31, 2016. A site visit with U.S. Fish & Wildlife Service,

Mr. Ray Bransfield and Ms. Tara Callaway, ECORP Consulting Mr. Brad Haley, and Caltrans Mr. Jeff Johnson, was conducted on October 1, 2015. Areas of impact were visited and evaluated. Mr. Jeff Johnson has had several discussions with USACE to discuss the jurisdictional features within the BSA in January 2014 and February 2014. During coordination, a meeting was scheduled between Caltrans and USACE personnel to discuss impacts and possible NEPA/404 coordination. On March 13, 2014, Caltrans personnel (Ron Kosinski, Karl Price, Robert Wang, Jeff Johnson, and Eric Hanson) met with USACE personnel (Stephanie Hall, David Castanon, and Crystal Huerta) to address impacts to USACE jurisdictional resources. A jurisdictional determination and delineation was submitted to the Army Corps of Engineers on August 14, 2015 for their review and approval. Limitations That May Influence Results

The collection of biological field data is normally subject to environmental factors that cannot be controlled or reliably predicted. Consequently, the interpretation of field data must be conservative and consider uncertainties and limitations necessarily imposed by the environment. However, due to the experience and qualifications of the consultant and Caltrans biologists involved in the surveys, this limitation was not expected to severely influence the results or substantially alter the findings.

It should be noted that the years of 2012, 2013, and 2014, experienced extremely low rainfall. Certain rare plants are only detectable during short periods in the growing season. Due to lack of rainfall, the possibility for detection for certain species is drastically reduced. As a result, focused plants surveys will continue to be conducted prior to construction in order to maximize detection.

Chapter 3. Results: Environmental Setting

3.1. Existing Conditions – Physical and Biological

3.1.1. Physical Conditions

Topography along the proposed route is mostly planar with few rolling hills west of the Mojave River. In the western area of the alignment numerous small washes cross a relatively planar, level landscape, generally draining from south to north. East of the town of Adelanto, the topography transitions to a series of low hills, then drops into the wide valley associated with the Mojave River at Mojave Heights. The river crossing is at a steep, rocky gorge. East of the river, the alignment climbs a boulder slope through Bell Mountain pass onto a wide, alluvial area associated with Bell Mountain Wash. In this area, numerous north-south running washes cross the corridor, with occasional rocky cairns protruding from the sandy flats. East of Interstate 15, the corridor continues over a series of hills modified by an active mining area, and on into the rocky foothills of the Granite Mountains.

The project area ranges in elevation from approximately 3,050 feet above mean sea level (AMSL) at the eastern project boundary and 2,995 feet AMSL at the western project boundary. The highest elevation (approximately 3,120 feet AMSL) occurs near Bell Mountain, east of I-15. The lowest elevations are along the Mojave River at approximately 2,660 feet AMSL.

3.1.1.1. SOIL TYPES

Within the Study Area, much of the desert floor is composed of alluvial deposits-the material laid down by rivers. These alluvial deposits are made up of faulted bedrock and shape the groundwater flow, leading to the creation of numerous dry lakes. The soils in the Study area consist primarily of coarse-textured soils developed from these alluvial deposits. The following soil series and complexes occur within the proposed alignments:

Adelanto, Arizo, Bousic, Bryman, Cajon Series, Cajon-Arizo Complex, Greenfield, Haplargids-Caliciorthids Complex, Helendale Series, Hesperia, Kimberlina, Lavic, Manet Series, Mirage-Joshua Complex, Mohave Series, Nebona-Cuddeback Complex, Pits, Riverwash, Rock Outcrop-Lithic Torriorthents Complex, Rosamond, Trigger-Sparkhule-Rock Outcrop Association, Victorville, Villa, Wasco Sandy Loam, and Yermo-Kimberlina**.**

Duneland, miscellaneous water, pits, and riverwash landforms also occur within the Project area. These landforms are areas with little-developed soils, however hydric

soils can develop within miscellaneous water and riverwash areas [USDA 2009]. Summary characteristics based on official series descriptions for each of the soil series within the alignments are provided below. Some of these soil series are referenced with alphanumeric codes and unit symbols on soil maps. These maps can be found within the JD reports in Appendix I.

3.1.1.1.1. Adelanto Series

The Adelanto series (coarse-loamy, mixed superactive, thermic Xeric Haplargids) consists of very deep, well-drained soils that formed in granitic parent material on alluvial fans and plains. Textures are a sandy loam. The Adelanto soils have brown and light brown slightly acid and neutral sandy loam A horizons, reddish brown, moderately alkaline somewhat finer textured sandy loam B2t horizons and brown somewhat coarser sandy loam alluvial C horizons. The soils are usually dry throughout the year. Runoff is low to very low and permeability is moderate to moderately rapid in these soils.

3.1.1.1.2 Arizo Series

The Arizo series (sandy-skeletal, mixed, thermic Typic Torriorthents) consists of very deep, excessively drained soils that formed in mixed alluvium. Arizo soils occur on recent alluvial fans, inset fans, fan apron, fan skirts, stream terraces, floodplains of intermittent streams and channels. These soils are neutral to strongly alkaline, with effervescent in some or all parts, with thin calcium carbonate coatings on undersides of rock fragments in some pedons. There typically is negligible to medium runoff and rapid to very rapid permeability in soils mapped as Arizo series. Arizo soils typically average coarse sand through loamy sand textures. Arizo series is usually dry, and may be moist for short periods throughout the moisture control section during December through March. This series is typically moist above and periodically in upper part of moisture control section for 10 to 20 days cumulative, during July through October. The soil has a typic aridic soil moisture regime.

3.1.1.1.3. Bousic Series

The Bousic series (fine, mixed, superactive, calcareous, thermic Typic Torriorthents) consists of deep, moderately well drained soils that formed in fine textured alluvium derived mainly from granitic rock sources. Bousic soils are on basin rim areas and have slopes of 0 to 1 percent. The soil is usually dry and is not continuously moist for as long as 60 days. It is strongly saline alkali in the upper portions of the pedon, with other pedons moderately alkaline. Textures are typically clay, but can range from silty clay loam to silty clay. This soil is moderately well drained with slow runoff and permeability. The soil in areas with 104 map unit symbol can exhibit hydric soil characteristics if the unit is within depressions.

3.1.1.1.4. Bryman Series

The Bryman series (fine-loamy, mixed, superactive, thermic Typic Haplargids) consists of deep, well drained soils that formed in alluvium from dominantly granitic sources. Bryman soils occur on terraces and older alluvial fans and have slopes of 0 to 15 percent. The soil is usually dry and is not continuously moist for as long as 60 days. It is moderately alkaline with a typically sandy clay loam texture. These soils are well drained with slow runoff and moderately slow permeability. The soils in areas with 109 map unit symbol can exhibit hydric soil characteristics if the unit is within fan remnants.

3.1.1.1.5. Cajon Series

The Cajon Series (mixed, thermic Typic Torripsamments) consists of very deep, somewhat excessively drained soils that form in sandy alluvium from dominantly granitic rocks. Cajon soils occur on alluvial fans, fan aprons, fan skirts, inset fans and river terraces. This soil series is usually dry from mid-March to mid-December and is not continuously moist for as long as 90 days in the winter. Typically, the profile is slightly alkaline or moderately alkaline although some pedons are neutral. Textures range from coarse sand, loamy coarse sand, sand, loamy sand, fine sand, or loamy fine sand or their gravelly or cobbly equivalents. These soils have negligible to low runoff and rapid permeability. Flooding is rare to none. The soils in areas with CaA map unit symbol can exhibit hydric soil characteristics if the unit is within playa landforms.

3.1.1.1.6. Cajon-Arizo Complex

Both Cajon series and Arizo series soils are normally present within this map unit.

3.1.1.1.7. Greenfield Series

The Greenfield series (coarse-loamy, mixed, active, thermic Typic Haploxeralfs) consists of deep, well drained soils that form in moderately coarse and coarse textured alluvium derived from granitic and mixed rock sources. Greenfield soils occur on alluvial fans and terraces and have slopes of 0 to 30 percent. Textures are typically coarse sandy loam. These soils have slow to medium runoff and moderately rapid permeability. The soils in areas with GsA map unit symbol can exhibit hydric soil characteristics if the unit is within drainageway or swale landforms.

3.1.1.1.8. Haplargids-Calciothids Complex

Soils within these map units have not been identified down to a soil series. These areas consist of soils with a discontinuous argillic horizon (formed from clay illuviation) within 30 inches of the soil surface. Some areas also have a petrocalcic horizon within 30 inches of the soil surface.

3.1.1.1.9. Helendale Series

The Helendale series (coarse-loamy, mixed, superactive, thermic Typic Haplargids) consists of very deep, well-drained soils that form in alluvium form granitoid rocks. Helendale soils occur on fan piedmonts, fan remnants, alluvial fans and terraces. Slopes range from 0 to 15 percent. The soils have a typic aridic soil moisture regime. It is slightly to moderately alkaline with a typically sandy loam texture. These soils are well drained with negligible to low runoff.

3.1.1.1.10. Hesperia Series

The Hesperia series (coarse-loamy, mixed, superactive, nonacid, thermic Xeric Torriorthents) consists of very deep, well-drained soils that form in alluvium derived primarily from granite and related rocks. Hesperia soils occur on alluvial fans, valley plains and stream terraces. The soil is dry in all parts, unless irrigated, from early May until early November. Organic matter content is very low and decreases regularly with increasing depth. The soils are typically calcareous in subsurface horizons. The soils in areas with HgA, HgA2, HkA, HmA, and HnA map unit symbols can exhibit hydric soil characteristics if the unit is within playa landforms.

3.1.1.1.11. Kimberlina Series

The Kimberlina series (coarse-loamy, mixed, superactive, calcareous, thermic Typic Torriorthents) consists of very deep, well-drained soils on flood plains and recent alluvial fans derived dominantly from igneous and/or sedimentary rock sources. Slope is 0 to 9 percent. The soil is dry continually from April until mid-January and is moist in all parts for less than 60 consecutive days in the winter. It is moderately alkaline with textures ranging from loamy fine sand to sandy clay loam. These soils are well drained with negligible to medium runoff with moderately rapid and moderate permeability, however saline-sodic phases and soils with sandy clay loam substratums have moderately slow permeability.

3.1.1.1.12. Lavic Series

The Lavic series (coarse-loamy, mixed, superactive, thermic Petronodic Haplocalcids) consists of very deep, moderately well drained soils that form in mixed alluvium dominantly from granitic sources. Lavic soils occur on fan piedmonts, alluvial fans and basin rim positions and have slopes of 0 to 5 percent. The soil is usually dry and is not continuously moist for as long as 60 days. Lavic series is moderately alkaline with textures from loam to sand. This soil is well drained with very low to medium runoff and moderate permeability. The soil in areas with 140 map unit symbol can exhibit hydric soil characteristics if the unit is within playa formations.

3.1.1.1.13. Manet Series

The Manet series (sandy, mixed, thermic Typic Torrifluvents) consists of deep, well drained soils that form in alluvium derived mainly from micaeous dark colored minerals. Manet soils are on alluvial fans and have slopes of 0 to 9 percent. The soil is usually dry except for a few months in winter and is not continuously moist for as long as 60 days. It is moderately alkaline with textures from coarse sand to fine sandy loam. These soils are well drained with slow from coarse sand to fine sandy loam. These soils are well drained with slow runoff and moderately rapid permeability. The soil in areas with 146 map unit symbol can exhibit hydric soil characteristics if the unit is within fan remnant formations.

3.1.1.1.14. Mirage-Joshua Complex

Both Mirage series (fine-loamy, mixed, superactive, thermic Typic Haplosalids) and Joshua series (fine-loamy, mixed, superactive, thermic Argidic Argidurids) are normally present within this map unit. Soils in this map unit typically consist of deep, well drained soils that form in mixed alluvium, dominantly from granitic sources and volcanic rock (Joshua series). These soils occur on old terraces with well-developed erosion pavement and have slopes of 2 to 5 (Mirage series) or 15 (Joshua series) percent. The soil is usually dry and is not continuously moist for as long as 60 days. Subsurface soils are slightly alkaline and become moderately alkaline. Textures range from sandy loam to clay loam in the Mirage series and from gravelly heavy sandy loam to loam in the Joshua series. These soils are well drained with medium to rapid runoff and moderately slow permeability.

3.1.1.1.15. Mohave Series

The Mohave series are well-drained soils that have formed in granitic alluvium. These soils are on terraces and have slopes of 2 to 5 percent. Permeability is moderately slow in this soil.

3.1.1.1.16. Nebona-Cuddeback Complex

Both Nebona series and Cuddeback series are normally present within this map unit. The Nebona-Cuddeback series consists of shallow (Nebona series) or moderately deep (Cuddeback series), well drained soils that form in mixed alluvium. These soils occur on terraces and have slopes of 2 to 9 percent. The Cuddeback series is moist in some part from November to March but both soils are not continuously moist for as long as 60 days. Within the Nebona series, the surface soil is usually nonsaline but the lower horizons range from slightly to strongly saline or alkali. Within the Cuddeback series the solum is slightly saline and it is mildly alkaline or moderately alkaline throughout. The soil texture is typically sandy loam with 18 to 25 percent clay content in subsurface horizons in the Cuddeback series. These soils are well

drained with medium to rapid runoff and moderately rapid (Nebona series) or moderately slow (Cuddeback series) permeability in the upper part but very slow in the duripan. The soil in areas with 151 map unit symbol can exhibit hydric soil characteristics if the unit is within playa formations.

3.1.1.1.17. Pits

Consists of beds of very gravelly or very cobbly stratified alluvium, which are often open excavations where soil is removed and the underlying material or bedrock is extracted. This unit is highly varied in its characteristics and properties.

3.1.1.1.18. Riverwash

Riverwash consists of sandy material in the beds of intermittent streams. Narrow stringers of gravelly sand occupy many of the areas. During each flood, fresh deposits of alluvium are laid down and removed as the result of streambank erosion. The hazard of soil blowing is slight to moderate. Little or no vegetation is on the areas.

3.1.1.1.19. Rock Outcrop-Lithic Torriorthents Complex

Rock outcrops and areas with poorly developed soils are normally present within this map unit.

3.1.1.1.20. Rosamond Series

The Rosamond series (fine-loamy, mixed, superactive, calcareous, thermic Typic Torrifluvents) consists of deep, well-drained soils that form in material weathered mainly from granitic alluvium. Rosamond soils occur on the lower margin of the alluvial fans between the sloping fans and the playas and have slopes of 0 to 2 percent. The soils are usually dry more than 75 percent of the time and are not moist for periods up to 60 consecutive days. Usually the soil is calcareous and moderately alkaline throughout. These soils have medium runoff and moderate to moderately slow permeability. The soils in areas with Ro and Rp map unit symbols can exhibit hydric soil characteristics if the unit is within playa landforms.

3.1.1.1.21. Trigger-Sparkhule-Rock Outcrop Association

Consists of 40% Trigger gravelly sandy loam, 30% Sparkhule gravelly sandy loam, and 30% Rock outcrop on upland foothills. Permeability of Trigger soil is moderately rapid with available water capacity very low. Permeability of Sparkhule soil is moderately slow with available water capacity very low or low.

3.1.1.1.22. Victorville Series

The Victorville series (coarse-loamy, mixed, superactive, calcareous, thermic Typic Torrifluvents) consists of deep, moderately well drained soils that form in mixed alluvium, dominantly from granitic sources. Victorville soils occur on low river terraces and flood plains and have slopes of 0 to 2 percent. The soil is moist in some or all parts from mid-December until mid-March and is dry throughout the remainder of the year. It is slightly alkaline to moderately alkalinity in subsurface horizons. The soil texture ranges from sandy loam to fine sandy loam. This soil is moderately well drained with medium runoff and moderately rapid permeability. The soil in areas with 169 map unit symbol can exhibit hydric soil characteristics within flood plains.

3.1.1.1.23. Villa Series

The Villa series (sandy, mixed, thermic Typic Torrifluvents) consist of deep, moderately well drained soils that form in alluvium derived mainly from granitic rocks. Villa soils occur on river flood plains and have slopes of 0 to 2 percent. The soil is usually dry and is not moist or as long as 60 consecutive days. It is mildly alkaline with a loamy sand texture. The soil is moderately well drained with an intermittent water table occurring at a depth of 3 to 6 feet for brief intervals during the winter and late spring. It has slow runoff and moderately rapid permeability. The soil in areas with 171 map unit symbol can exhibit hydric soil characteristics within fan remnant landforms.

3.1.1.1.24. Wasco

Consists of very deep, moderately well drained soil on alluvial fans formed in alluvium derived dominantly from granitic material. Permeability is moderately rapid with available water capacity low or moderate.

Yermo-Kimberlina

Consists of 60% Yermo cobbly sandy loam and 30% Kimberlina gravelly sandy loam on broad, smooth alluvial fans or hills. Permeability of Yermo soil is moderately rapid with available water capacity low. Permeability of Kimberlina soil is moderately rapid with available water capacity moderate.

3.1.2. Biological Conditions

3.1.2.1. PLANT COMMUNITIES

The BSA comprises 30 plant communities, seven of which are designated as both disturbed and undisturbed, and 6 land cover types for a total of 36 different plant communities/land cover types. [AA1]

The predominant plant communities observed within the BSA were creosote bush scrub, Joshua tree woodland, fourwing saltbush scrub, allscale scrub, and rubber rabbitbrush scrub. Riparian scrub and riparian woodland also occur, primarily in the Mojave River area. Plant communities and other land cover categories in the BSA are described in this section and referred to in Plant Community Mapping Reports in Appendix C.

Some of the plant communities described below refer to absolute and relative cover. Absolute cover is defined as the total cover of all vascular vegetation in an area that takes into consideration the porosity, or holes, in the vegetation. This estimate is usually in the form of a percentage and disregards overlap of the various tree, shrub, and/or herbaceous layers and species. Relative cover is defined as the total cover of a particular species in proportion to all other species within that layer, and when added together with other shrubs within that layer, always equates to 100%.

Allscale Scrub (Disturbed and Undisturbed): Federal Status - none; State Status - 4. Allscale scrub (*Atriplex polycarpa* shrubland alliance) consists primarily of low-growing shrubs dominated by allscale with an open to continuous canopy and a variable herbaceous layer that includes seasonal annuals. Allscale scrub can be found in a variety of habitats such as washes, alluvial fans, rolling hills, and terraces. Within the BSA, other species present in this community included white bursage (*Ambrosia dumosa*), fourwing saltbush (*Atriplex canescens*), and creosote bush (*Larrea tridentata*). Allscale scrub was found throughout the eastern half of the BSA and had a total acreage of approximately 263 acres. Disturbed allscale scrub is identical in species composition, habitat, and soil type to that of the undisturbed allscale scrub. However, within the BSA, it exhibits a relatively higher level of disturbance (25-50 percent) and the herbaceous layer consists primarily of non-native grasses. There was approximately 90 acres of disturbed allscale scrub observed within the BSA.

Big Sagebrush (Undisturbed): Federal Status - none; State Status - 5. Big sagebrush (*Artemisia tridentata* shrubland alliance) is the dominant species in a plant community with shrubs typically less than five feet (two meters) in height and a sparse or grassy herbaceous layer. This community is often found in plains, alluvial fans, stream channels, and dry washes with deep, well-drained, sandy to loamy soil. Associated native species present in this community within the BSA included wild tarragon (Artemisia *dracunculus*), fourwing saltbush and various non-native brome grasses (*Bromus spp*.). Areas consisting of big sagebrush were observed at the western end of the alignment in the City of Palmdale. Approximately 21 acres of big sagebrush was observed within the BSA.

Black Willow Thickets (Disturbed and Undisturbed): Federal Status - none; State Status - 4. Black willow thickets (*Salix gooddingii* woodland alliance) are a special-status plant community that consist of black willow as a dominant or co-dominant in the tree canopy with an open to continuous shrub layer and a variable herbaceous layer. This community is found on terraces along large rivers and canyons, and along rocky floodplains of small, intermittent streams, seeps, and springs. The USFWS Wetland Inventory lists black willow as a facultative wetland species (USFWS 1996). Isolated patches of black willow thickets were present within shrub communities located in the western portion of the BSA. Sandbar willow (*Salix exigua*) and herbaceous species such as annual bursage (*Ambrosia acanthocarpa*) and doveweed (*Eremocarpus setigerus*) were observed in this community. Small patches of black willow thickets were found at the western end of the alignment associated with rubber rabbitbrush scrub. Disturbed black willow thickets are identical in species composition, habitat, and soil type to that of the undisturbed black willow thickets. However, within the BSA, it exhibits a relatively higher level of disturbance (25-50 percent) and the herbaceous layer consists primarily of non-native grasses. Approximately 1 acre of black willow thickets and 6 acres of disturbed black willow thickets were observed within the BSA.

California Buckwheat Scrub (Undisturbed): Federal Status - none; State Status - 4. California buckwheat scrub (*Eriogonum fasciculatum* shrubland alliance) is a low-growing shrub community dominated by California buckwheat. Various other woody shrubs are present, forming an open to intermittent canopy. The herbaceous layer is variable and may be grassy. California buckwheat scrub is found on upland slopes, arroyos, channels, and washes with coarse, well-drained soils that are moderately acidic to slightly saline. Within the BSA, this community, located on and above cliff faces along Highway 14, included white bursage, creosote bush, and chaparral yucca (*Hesperoyucca whipplei*). Approximately 6 acres of California buckwheat scrub were observed within the BSA.

California Bulrush/American Bulrush Marsh (Undisturbed): Federal Status - none; State Status – 4?/3.2. California bulrush-American bulrush marsh (*Schoenoplectus californicus – Schoenoplectus americanus* association) is a special-status plant community co-dominated by California bulrush and American bulrush and falls within the *Schoenoplectus californicus* herbaceous alliance. The herbaceous layer, which is less than four meters in height, is intermittent to continuous and shrubs may be present at low cover. California bulrush-American bulrush marsh is found in brackish to freshwater marshes, shores, bars, and channels of river mouth estuaries. Soils have a high organic content and are poorly aerated. The USFWS Wetland Inventory lists both species of bulrush as an obligate wetland species (USFWS 1996). California bulrush-American bulrush marsh was

found within the Mojave River channel in the eastern portion of the BSA. Southern cattails (*Typha domingensis*) were also present in this community. Approximately 2 acres of California bulrush/American bulrush marsh were observed within the BSA.

Cheesebush Scrub (Undisturbed): Federal Status - none; State Status - 4. The cheesebush scrub (*Ambrosia salsola* shrubland alliance) community is dominated or co-dominated by cheesebush with intermittent to open canopy. Cheesebush is a short-lived shrub with shallow roots that is highly prolific and opportunistic when water is prevalent. Other common native species within cheesebush scrub include desert lavender (*Hyptis emoryi*), smokethorn (*Psorothamnus spinosus*), golden cholla (*Cylindropuntia echinocarpa*), brittlebush, green ephedra (*Ephedra californica*), California buckwheat, creosote bush (*Larrea tridentata*), and other desert natives found within the shrub canopy. Approximately 2 acres of cheesebush scrub were observed within the BSA.

Creosote Bush Scrub (-Allscale Scrub, -White Bursage Scrub, Disturbed and Undisturbed): Federal Status - none; State Status - 5. The creosote bush scrub (*Larrea tridentata* shrubland alliance) community is dominated by creosote bush with an intermittent to open canopy. The herbaceous layer is also intermittent to open with seasonal annuals or perennial grasses. Soils are well-drained, sometimes with desert pavement. Within the BSA, white bursage, Nevada joint-fir (*Ephedra nevadensis*), and Joshua trees (*Yucca brevifolia*) were also present in this community. Creosote bush scrub was one of the more prevalent communities and was found throughout the BSA. Creosote bush-allscale scrub alliance and creosote bush-white bursage scrub series are mixtures of respective habitat communities and make up small portions of the BSA (see allscale scrub and white bursage scrub for more information regarding these communities). Disturbed creosote bush scrub is identical in species composition, habitat, and soil type to that of the undisturbed creosote bush scrub. However, within the BSA, it exhibits a relatively higher level of disturbance (25-50 percent) and the herbaceous layer consists primarily of non-native grasses. Approximately 3,778 acres of creosote bush scrub, 1 acre of creosote bush scrub/allscale scrub, 1 acre of creosote bush scrub/white bursage scrub, and 406 acres of disturbed creosote bush scrub were observed within the BSA.

Fourwing Saltbush Scrub (Disturbed and Undisturbed): Federal Status - none; State Status - 4. The fourwing saltbush (*Atriplex canescens* shrubland alliance) scrub community is dominated by a single species of saltbush, the fourwing saltbush. Fourwing saltbush scrub is a low-growing plant community with shrubs typically less than three feet (one meter) in height. This community is usually found on fine-textured, poorly-drained soils with high alkalinity and/or salinity. Additional shrub

species present within the fourwing saltbush scrub along the BSA included allscale, big sagebrush, and green rabbitbrush (*Chrysothamnus viscidiflorus*). This community was observed throughout the BSA. Disturbed fourwing saltbush scrub is identical in species composition, habitat, and soil type to that of the undisturbed fourwing saltbush scrub. However, within the BSA, it exhibits a relatively higher level of disturbance (25-50 percent) and the herbaceous layer consists primarily of non-native grasses. Approximately 318 acres of fourwing saltbush scrub and 137 acres of disturbed fourwing saltbush scrub were observed in the BSA.

Fremont Cottonwood Forest (Undisturbed): Federal Status - none; State Status – 3.2. Fremont cottonwood forest (*Populus fremontii* forest alliance) is a special-status plant community that occurs along streams and in canyons, with Fremont cottonwood being the dominant species. Often, Fremont cottonwood is found in pure stands, although minor stands of other riparian tree species, such as boxelder (*Acer negundo*), California sycamore (*Platanus racemosa*), and various willows (*Salix ssp.*), can also occur. The USFWS Wetland Inventory lists Fremont cottonwood as a facultative species (USFWS 1996). Fremont cottonwood forest was present along the Mojave River channel and the Big Rock Creek wash. Other species observed within this community at the Mojave River location included giant reed (*Arundo donax*) and red willows (*Salix laevigata*). Within the Fremont cottonwood forest along the Big Rock Creek wash, various herbaceous species, such as annual bursage and white-stemmed stickleaf (*Mentzelia albicaulis*) were present. Approximately 21 acres of Fremont cottonwood forest were observed within the BSA.

Joshua Tree Woodland (Disturbed and Undisturbed): Federal Status - none; State Status – 3.2. Joshua tree woodland (*Yucca brevifolia* woodland alliance) is a special-status plant community that typically occurs on gently sloped alluvial fan areas. It is characterized by an open to intermittent tree canopy (at least 10 percent cover) of Joshua trees up to 39 feet (12 meters) in height, which may be associated with many different understory shrub communities. The herbaceous layer is open to intermittent with seasonal annuals or perennial grasses. Shrub species present in the Joshua tree woodland present along the BSA included fourwing saltbush, creosote bush, and rubber rabbitbrush (*Ericameria nauseosa*). This community was found in the western and central portions of the BSA. Disturbed Joshua tree woodland is identical in species composition, habitat, and soil type to that of the undisturbed Joshua tree woodland. However, within the BSA, it exhibits a relatively higher level of disturbance (25-50 percent) and the herbaceous layer consists primarily of non-native grasses. Approximately 512 acres of Joshua tree woodland and 93 acres of disturbed Joshua tree woodland were observed within the BSA.

Mojave Yucca Scrub (Undisturbed): Federal Status - none; State Status - 4. The Mojave yucca scrub (*Yucca schidigera* shrubland alliance) plant community is characterized by open to intermittent shrub and herbaceous layers. Mojave yucca can either be dominant or present with two percent or greater absolute cover. Other native shrub species, such as white bursage and creosote bush, may exhibit higher cover. Mojave yucca scrub is often present on alluvial fans, rocky slopes, and upper bajadas; soils are well-drained, sandy loams. Small areas consisting of Mojave yucca scrub were present west of the Mojave River and east of I-15. These areas were rocky and included creosote bush and various cactus species, such as golden cholla (*Cylindropuntia echinocarpa*) and cottontop (*Echinocactus polycephalus*). Approximately 23 acres of Mojave yucca scrub were observed within the BSA.

Nevada Joint Fir Scrub (Undisturbed): Federal Status - none; State Status – 4.3. Nevada joint fir scrub (*Ephedra nevadensis* scrub alliance) is characterized by open to intermittent stands of the dominant shrub Nevada joint fir (*Ephedra nevadensis*). Typically, this community occurs on well-drained gravelly or rocky soils between 3,280 and 5,905 feet above mean sea level. Associated species in the BSA included rubber rabbitbrush (*Ericameria nauseosa*), cheesebush, allscale, Anderson's peach thorn (*Lycium andersonii*), California buckwheat, and occasional Joshua trees. This community mostly intergrades with creosote bush scrub or Joshua tree series in the BSA, but a relatively pure stand of Nevada joint fir scrub is found in the extreme western portion of the alignment between Sierra Highway and 3rd Street East, north of Rancho Vista Boulevard. Approximately 5 acres of Nevada joint fir scrub were observed within the BSA.

Non-native Grasslands: Federal Status - none; State Status - none. Non-native grassland communities, non-native grasses such as *Schismus spp.*, *Poa spp*. and *Bromus spp*. are dominant or co-dominant with other non-natives in the herbaceous layer. Shrubs may be present at low cover. This plant community occurs in various areas within the BSA, typically areas of heavy disturbance near roads and developments. Approximately 16 acres of non-native grasslands were observed within the BSA.

Red Brome Grasslands: Federal Status - none; State Status - none. Red brome grasslands (*Bromus rubens* Herbaceous Semi-Natural Alliance), red brome (*Bromus madritensis ssp. rubens*) is dominant or co-dominant with other non-natives in the herbaceous layer. Shrubs may be present at low cover. This community is mostly monotypic and therefore separated from the non-native grasslands plant community. Red brome grassland occurs within various parts of the BSA, typically areas of heavy disturbance near roads and developments. Approximately 6 acres of red brome grasslands were observed within the BSA.

Red Willow Thickets (Undisturbed): Federal Status - none; State Status - 3. Red willow thickets (*Salix laevigata* woodland alliance) are considered a special-status plant community which consist of red willow as a dominant or co-dominant in the tree canopy with an open to continuous shrub layer and a variable herbaceous layer. This community is found in ditches, floodplains, lake edges, and low-gradient depositions along streams. The USFWS Wetland Inventory lists red willow as a facultative wetland species (USFWS 1996). Red willow thickets bordered the Mojave River channel within the eastern portion of the BSA. Other species present in this community included Fremont cottonwood and sandbar willows. Approximately 2 acres of red willow thickets were observed within the BSA.

Rubber Rabbitbrush Scrub (Disturbed and Undisturbed): Federal Status - none; State Status - 5. The rubber rabbitbrush scrub (*Ericameria nauseosa* shrubland alliance) plant community may consist of monotypic stands or be a diverse shrub community dominated by rubber rabbitbrush. The shrub canopy is open to continuous with individual plants less than nine feet (three meters) tall. Emergent trees may be present at low cover with a sparse or grassy herbaceous layer. Rubber rabbitbrush scrub is found in varied topography, especially in disturbed settings where it can rapidly establish. Soils are well-drained sands and gravels. Other species present in rubber rabbitbrush scrub along the BSA included big sagebrush, fourwing saltbush, and various non-native brome grasses. This community was prevalent in and around the City of Palmdale. Disturbed rubber rabbitbush scrub is identical in species composition, habitat, and soil type to that of the undisturbed allscale scrub. However, within the BSA, it exhibits a relatively higher level of disturbance (25-50 percent) and the herbaceous layer consists primarily of non-native grasses. Approximately 125 acres of rubber rabbitbrush scrub and 572 acres of disturbed rubber rabbitbrush scrub were observed within the BSA.

Salt Grass Flats (Disturbed): Federal Status - none; State Status – 4. Salt grass (*Distichlis spicata* flats alliance) is dominant in the herbaceous layers, often occurring with *Bromus* sp. Stands occur in terraces along washes that are typically intermittently flooded. Soils are often deep, alkaline, or saline, and often have an impermeable layer making them drain poorly. When the soil is dry, the surface usually has salt accumulations. Approximately 9 acres of disturbed salt grass flats were observed within the BSA.

Sandbar Willow Thickets (Undisturbed): Federal Status - none; State Status – 4.2. The sandbar willow thicket (*Salix exigua* shrubland alliance) plant community is found in floodplains, depositions along rivers and streams, and at springs. Sandbar willow is the dominant or co-dominant in the shrub canopy; emergent riparian trees may be present at low cover and the herbaceous layer is variable. The USFWS

Wetland Inventory lists sandbar willow as a facultative wetland species (USFWS 1996). Sandbar willow thickets, found within the Mojave River channel, consisted primarily of pure stands. Approximately 4 acres of sandbar willow thickets were observed within the BSA.

Scale Broom Scrub (Undisturbed): Federal Status - none; State Status - 3. Scale Broom scrub (*Lepidospartum squamatum* shrubland alliance) is a special-status plant community in which scalebroom (*Lepidospartum squamatum*) is dominant, co-dominant, or conspicuous in the shrub canopy. Emergent trees may be present at low cover with a variable herbaceous layer. Scalebroom scrub is restricted to intermittently or rarely flooded, low-gradient alluvial deposits along streams, washes, and fans. Within the BSA, this community included cheesebush (*Ambrosia salsola*), fourwing saltbush, and desert dicoria (*Dicoria canescens*). Scalebroom scrub was present within a large wash system located between 70th and 90th Streets East. Approximately 25 acres of scalebroom scrub were observed within the BSA.

Southern Cattail Marsh (Undisturbed): Federal Status - none; State Status - 5. Southern cattail marsh (*Typha domingensis* herbaceous alliance) is a special-status plant community in which southern cattails are dominant or co-dominant in the herbaceous layer. Emergent trees such as Salix spp. may be present at low cover and the herbaceous layer, which is less than 1.5 meters in height, is intermittent to continuous. Southern cattail marsh is found in semi-permanently flooded freshwater or brackish marshes with clayey or silty soils. Southern cattail marsh was present in the Mojave River channel within the eastern portion of the BSA. Additional species observed in this community included American bulrush and California bulrush; Canada horseweed (*Erigeron canadensis*) and white sweet clover (*Melilotus albus*) were observed immediately adjacent. Approximately 1 acre of southern cattail marsh was observed within the BSA.

White Bursage Scrub (Disturbed and Undisturbed): Federal Status - none; State Status - 4. White bursage scrub (*Ambrosia dumosa* shrubland alliance) consists of an open to intermittent canopy with white bursage as the dominant or co-dominant species. Individual shrubs are less than 3 feet (one meter) in height, although taller species such as creosote bush may be present at low cover. The herbaceous layer is open to intermittent with seasonal annuals. White bursage is found within older washes and river terraces, and on alluvial fans, rocky hills, and upland slopes with sandy, clay-rich, or calcareous soils. Within the BSA, this community included fourwing saltbush and creosote bush. Small areas consisting of white bursage scrub were present within the central portion of the BSA.

Approximately 38 acres of white bursage scrub and 90 acres of disturbed white bursage scrub were observed within the BSA.

Agriculture. Agriculture is not a plant community but rather a land cover type. Areas classified as agriculture are presently, and often historically, severely disturbed parcels of land used for the production of food and fiber. The soils in and around these areas are often compacted from the mechanized equipment used to maintain the crops and fields and vegetation consists of irrigated field crops. Within the BSA, this land cover type includes both active agriculture fields and fields that have been recently disked or plowed or are no longer used to produce crops. Such fallow fields are slowly being encroached by non-native herbaceous plant species, and in some cases, native annual wildflowers, and are often adjacent to active fields. Approximately 208 acres of this land cover type were observed within the BSA.

Disturbed. The disturbed classification includes areas where the native vegetation community has been heavily influenced by human actions such as grading, trash dumping, and off-road use, but that lack development. Within disturbed areas of the BSA; vegetation was absent or consisted primarily of non-native species, such as red brome, red-stemmed filaree (*Erodium cicutarium*), Russian thistle (*Salsola tragus*), and Mediterranean grass (*Schismus barbatus*). Approximately 586 acres of disturbed areas were observed within the BSA.

Developed. Areas designated as developed will have infrastructure present and any vegetation in the immediate surroundings represents ornamental landscaping. Developed areas within the BSA included residences and commercial businesses. Often these developed areas were located adjacent to disturbed communities. Approximately 1059 acres of developed land cover were observed within the BSA.

Rock Outcrop. Rock crop is a land cover type in which bedrock is visibly exposed and very little vegetation, if any, is present. Species that were observed on rock outcrops reflected that of the vegetation community immediately adjacent. Within the BSA, rock outcrop is located near the Mojave River, primarily on the east side. Approximately 25 acres of rock outcrop land cover were observed within the BSA.

Unvegetated Wash. Unvegetated washes comprise the Mojave River channel and various sandy desert ephemeral washes along the BSA that are often void of vegetation. During the spring, some annual herbaceous species, such as gilia (*Gilia spp.)* and woollystar (*Eriastrum spp*.), may be present in low numbers. Approximately 10 acres of unvegetated washes were observed within the BSA.

Windrow. Windrows consist of various tree species (usually non-native) that were historically used to create windrows or wind breaks. Although the associated

development or agriculture may no longer be present, remnant windrows are still often found in desert regions of California. A windrow consisting of saltcedar (*Tamarisk ramosissima*) was located along the eastern side of 40th Street East within the BSA. Approximately 1 acre of windrow was observed within the BSA.

Table 3 summarizes the plant communities/land covers observed within the BSA.

Table 3: Total Acreage of Plant Communities/Land Covers

Plant Community/Land Cover Type	Total Acreage within BSA (acres)	Status*
Agriculture	208.14	State: n/a
Allscale scrub Alliance	262.98	State: 4
Big sagebrush Alliance	21.15	State: 5
Black willow thickets	1.20	State: 3
California buckwheat scrub Alliance	5.76	State: 4
California bulrush-American bulrush marsh	1.53	State: 4?/3.2
Cheesebush scrub Alliance	2.14	State: 4
Creosote bush scrub Alliance	3778.01	State: 5
Creosote bush scrub/Allscale scrub Alliance	0.39	State: 5/4
Creosote bush/White bursage scrub series	0.44	State: 5/4
Developed	1058.18	State: n/a
Disturbed	585.75	State: n/a
Disturbed Allscale scrub Alliance	90.46	State: 4
Disturbed black willow thickets	5.52	State: 3
Disturbed Creosote bush scrub Alliance	405.53	State: 5
Disturbed fourwing saltbush scrub Alliance	137.49	State: 4
Disturbed Joshua tree woodland Alliance	92.54	State: 3.2
Disturbed rubber rabbitbrush scrub Alliance	572.43	State: 5
Disturbed salt grass flats Alliance	8.76	State: 4
Disturbed white bursage scrub Alliance	89.57	State: 4
Fourwing saltbush scrub Alliance	317.87	State: 4
Fremont cottonwood forest Alliance	21.38	State: 3.2
Joshua tree woodland Alliance	511.53	State: 3.2
Mojave yucca scrub Alliance	22.62	State: 4
Nevada joint fir scrub	5.23	State: 4.3
Non-native grassland	15.83	State: n/a
Red brome grasslands	6.32	State: n/a

Plant Community/Land Cover Type	Total Acreage within BSA (acres)	Status*
Red willow thickets	1.77	State: 3
Rock outcrop	24.70	State: n/a
Rubber rabbitbrush scrub Alliance	125.35	State: 5
Sandbar willow thickets Alliance	3.80	State: 4.2
Scale broom scrub Alliance	24.99	State: 3
Southern cattail marsh	0.55	State: 5
Unvegetated wash	10.31	State: n/a
White bursage scrub Alliance	37.81	State: 4
Windrow	0.59	State: n/a
All Plant Community/Land Cover Types Combined	**8458.62**	

* = Rarity and State Ranks: One purpose of the vegetation classification is to assist in determining the level of rarity and imperilment of vegetation types. Ranking of alliances according to their degree of imperilment (as measured by rarity, trends, and threats) follows NatureServe's Heritage Methodology, in which all alliances are listed with a S (state) rank. For alliances with State ranks of S1-S3, all associations within them are also considered to be highly imperiled. A question mark (?) denotes an inexact numeric rank due to insufficient samples over the full expected range of the type, but existing information points to this rank.

S1: Fewer than 6 viable occurrences worldwide/ statewide, and/ or up to 518 hectares

S2: 6-20 viable occurrences worldwide/ statewide, and/ or more than 518-2,590 hectares

S3: 21-100 viable occurrences worldwide/ statewide, and/or more than 2,590-12,950 hectares

S4: Greater than 100 viable occurrences worldwide/ statewide, and/or more than 12,950 hectares

S5: Demonstrably secure because of its worldwide/ statewide abundance

Additional Threat Ranks

0.1: Very threatened

0.2: Threatened

0.3: No current threat known

If two plant communities are listed together, the Global rarity and California rarity are listed in sequential order, separated by a forward slash (/)

n/a – Does not pertain to a listing in the California Manual of Vegetation

Source

Data obtained from CDFW website: http://www.dfg.ca.gov/biogeodata/vegcamp/veg_manual.asp

3.1.2.2. HYDROLOGICAL RESOURCES[AA2]

Surface hydrology within the BSA primarily consists of ephemeral features typical of dryland fluvial systems, flowing only during storm events and remaining dry most of the year. One riverine and numerous ephemeral hydrological resources within the BSA were identified during jurisdictional delineations and plant community mapping efforts.

The western portion of the project lies within the Antelope-Fremont Valleys hydrologic unit code (HUC) watershed. The most prominent washes include, from west to east Little Rock Wash, Big Rock Wash, Grandview Canyon Creek, Graham Canyon Creek, and Mescal Creek. All of the drainages within the project area in the Antelope Valley-Fremont Valleys HUC watershed are considered isolated and flow toward the Rosamond dry lake, Buckhorn dry lake, and Rogers dry lake on Edwards Air Force Base. Except during the largest rainfall events of a season, surface water flows quickly percolate into streambeds and recharge the groundwater basin. Surface water flows that reach the dry lakes are generally lost to evaporation. Wetland and non-wetland waters in this watershed are not under the jurisdiction of the USACE. However, CDFW and SWRCB maintain jurisdiction over the wetland and non-wetland waters identified within this watershed. Non-wetland features include natural, un-vegetated channels bisecting undeveloped areas and un-vegetated roadside ditches. The mapped features flow ephemerally, during and shortly after rain events. Smaller dry washes had several indicators of ordinary high water mark (OHWM) including bed and bank, sediment deposition, and absence of vegetation. Some highly braided areas had very faint indicators of OHWM. Other slightly larger dry washes had more defined indicators of OHWM, including wracking, shelving, and more defined bed-and-bank. The characteristics observed within the mapped features suggest that they channel surface water, hence they are likely jurisdictional as Waters of the State and regulated by SWRCB and by CDFW as streambeds.

The eastern portion of the project lies within the Mojave River HUC watershed. The Mojave River is the dominant feature within the watershed. The Mojave River originates in the San Bernardino Mountains and flows northward through the high desert and provides muted hydrologic influence to Silver Lakes (two manmade navigable lakes in the City of Helendale) before eventually terminating within playas to the east of Baker in the central Mojave Desert. Portions of the river within the BSA are perennial due to local geology through the area known as “the narrows” (ECORP 2013). As such, the Mojave River qualifies as a navigable water of the U.S. under 33 CFR § 329 and meets the definition of a traditional navigable water (TNW). Ephemeral tributaries to the Mojave River include, from west to east, Sheep Creek, Fremont Washes, Turner Wash, Ossom Wash, and Bell Mountain Wash. These ephemeral tributaries meet the definition of non-relatively permanent waters (non-RPWs) Due to the Mojave River classification as a TNW, a significant nexus exists with its tributaries within the watershed even though they are non-RPWs. These waters of the U.S. drainages are within the Upper Fremont Wash and Mojave River-Bell Mountain Wash HUC subwatersheds. There are two closed basin sub-watersheds within the Mojave River Watershed, Apple Pond-Apple Valley Dry Lake (HUC 180902080304) and El Mirage Lake (HUC 180902080404). These hydrologic

units are considered 100 percent “non-contributing”, meaning that all surface flow is internal and no overland flow leaves the unit through the outlet point. Drainage features observed in these sub-watersheds were considered non-jurisdictional.

Perennial and ephemeral hydrological features were identified as potentially jurisdictional using several JD studies (Appendix I; AMEC 2012; ICF 2012; ECORP 2013; ECORP 2015a and 2015b), additional literature review, agency site visits, and recent USACE preliminary and approved jurisdictional determinations. A Section 404 Individual Permit (USACE), Section 401 Certification (SWRCB), and 1602 Lake and Streambed Alteration Agreement (CDFW) will be obtained prior to any impacts to jurisdictional resources.

To determine the estimated acreages of jurisdictional features associated with an alternative/variation/option, calculations are divided to differentiate between the main alignment common areas, the main alignment variations, the variation dips, and the rail options. These acreages should be considered preliminary until designs are finalized and jurisdiction is verified by USACE, SWRCB, and CDFW.

A combined total of approximately 157.44 acres of hydrological features were mapped within the BSA inclusive of all variations to the proposed alternatives (see Appendix I for summary JD map).

3.1.2.3. WILDLIFE MOVEMENT

Wildlife movement corridors are linkages of natural habitat between larger areas that are not contiguous or otherwise connected. The purpose of these linkages is to provide for seasonal travel routes or connecting important resources which would prevent the isolation of populations. Isolation of populations can have a negative effect on genetics of the individual population and possibly the species as a whole, and places the isolated population at risk of eventual elimination.

The proposed project site is located within a large contiguous open space area of the Mojave Desert with the east and west ends of the site within developed areas. As such there are no regional corridors linking two or more non-contiguous area of natural habitat within the project site rather the site is located within a larger contiguous open space. A large regional movement corridor located to the east of the proposed project site was identified and is depicted in Appendix H Wildlife Corridor Evaluations, AMEC, 2011, Figure 3.

Corridors within a contiguous open space could exist for a particular species if physical barriers specific to that species are present such as mountain ranges, rivers or impenetrable habitats, which could act to funnel or channel wildlife. Several large rivers or creeks occur within the limits of the proposed project, such as Mojave River,

Big Rock Wash, and Littlerock Wash, which could create such a channeling effect with individuals.

Wildlife identified during movement studies include gray fox (*Urocyon cinereoargenteus*), kit fox (*Vulpes macrotis*), coyote (*Canis latrans*), American badger (*Taxidea taxus*), and bobcat (*Lynx rufus*). For a complete list of all wildlife observed during movement studies refer to Appendix H. Wildlife Corridor Evaluations.

The Mojave River and its associated habitats, Big Rock Wash, Littlerock Wash, and several other larger drainages provide for wildlife movement and connectivity between large open spaces to the north and to the south of the proposed project site. See Appendix H Wildlife Corridor Evaluations, AMEC, 2011, Figure 5. Numerous smaller drainages along the proposed HDC also provide for local movement of wildlife within the open space immediately surrounding the proposed project site as noted by sign during various Caltrans field investigations. In addition, large expanses of creosote bush scrub within the region allow relatively unrestricted movement of various species of wildlife.

3.1.2.3.1. South Coast Missing Linkages

An interagency report produced by South Coast Wildlands (2008) identified a network of high-priority, not yet established landscape linkages within the South Coast Ecoregion, an area that extends along the coastal zone from southern Kern and Ventura Counties down into Baja California, for their potential to preserve the region's biodiversity and mitigate the effects of habitat loss and fragmentation. The linkages were identified based on their potential to connect large tracts of relatively intact wild areas and allow natural movement of wildlife throughout the region.

Three of the proposed linkages identified in the report cross the BSA: DE13, SC205, and DE16 (Penrod et al. 2012). Linkages DE13 and SC205 are adjacent to one another and cross the western portion of the BSA and are listed as medium priority. Linkage DE13 potentially represents a choke-point for movement for Mojave fringe-toed lizard (*Uma scoparia*). Linkage SC205 has potential to provide a landscape linkage for mountain lion (*Puma concolor*), desert tortoise, Mohave ground squirrel, and LeConte's thrasher (*Toxostoma lecontei*). Linkage DE16 crosses the eastern portion of the BSA and is listed as a high priority. DE16 potentially provides a landscape linkage for arroyo toad (*Anaxyrus californicus*), least Bell's vireo, and willow flycatcher (*Empidonax traillii*).

Five medium-priority linkages are present north, south, and southwest of the BSA: DE14 (three linkages within this designation), DE15, and SC113. None of these cross the BSA. DE14 represents three potential choke-points for desert tortoise,

while DE15 provides a potential landscape linkage for arroyo toad, large mammals, southwestern willow flycatcher, least Bell's vireo, peregrine falcon (*Falco peregrinus*), and bald eagle (*Haliaeetus leucocephalus*). SC113 represents a potential choke-point for large mammals, three-spine stickleback (*Gasterosteus aculeatus*), southwestern willow flycatcher, and western spadefoot toad (*Spea hammondii*).

3.1.2.3.1. California Essenitial Habitat Connectivity

The California Essential Habitat Connectivity Project (CEHC) was a collaboration between CDFW to identify the important wildlands that should be conserved for the purpose of habitat connectivity and wildlife movement state-wide (Spencer et al. 2010). The CEHC addresses these areas on a coarse scale and was intended to be used as a supplemental document paired with more refined regional and local habitat connectivity plans to create a complete picture of undeveloped lands that are important for movement activities, gene flow, and other resources necessary for supporting wildlife populations. It is important to note that the CEHC does not address the individual needs or occurrences of localized wildlife movement. Rather, it identifies lands that are most likely important to wildlife movement within the state.

In this document, a total of 850 Natural Landscape Blocks (NLBs) throughout the state of California were identified. These lands were designated as such due to their well-conserved and generally intact nature. A total of 192 Essential Connectivity Areas that provide substantial connections in and among the NLBs were also identified. The CEHC encourages the prioritization of land conservation and associated management activities within these areas to preserve, maintain, and enhance connectivity throughout the state's natural areas.

The CEHC has not identified any Essential Connectivity Areas within the BSA. The mountainous areas to the south of the BSA, the San Gabriel and San Bernardino Mountain Ranges, were identified as an Essential Connectivity Area with varying levels of energy expenditure for wildlife movement (i.e., some areas present a higher risk of mortality or may require more energy to travel through than other areas). Natural Landscape Blocks have been identified in multiple locations surrounding the Project, but none have been identified within or abutting the BSA.

3.1.2.4. COMMON WILDLIFE

A list of 61 wildlife species was observed, or detected by their sign, in the BSA and are included in Appendix K – Wildlife Compendium. This is a comprehensive list of all wildlife observed on all site visits, general studies, and focused surveys. Species observed included 42 bird species, 12 mammal species, and 7 reptile species.

In response to a comment on the DEIR/EIS made by CDFW, we are addressing the potential of suitable habitat and potential impacts to the shoulderband snail (*Helminthoglypta mohaveana*).

The shoulderband snail is not recognized by the federal or state government as special-status. This species is recognized by an international entity supported by private interest organizations with a rank of G1 and S1. Because ranking criteria for these listings are not fully understood the shoulderband snail is not recognized as special-status.

This species typically occurs under rocks among the leaves of riparian stand of trees within six feet from the Mojave River. Marginal habitat suited for this species occurs within the Mojave River upstream and downstream of the proposed project location as it would cross the river. No suitable habitat occurs within the proposed project footprint. Because conditions within the river can change from year to year based on amount of rainfall, there is potential for this species to occur within the reach of the Mojave River in the future at the time of construction, should this project receive approval.

3.2. Special-status Species

Table 4: Listed, Proposed Species, and Critical Habitat Potentially Occurring or Known to Occur in the Project Area.

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
PLANTS				
Calochortus striatus Alkali mariposa-lily	CNPS List 1B.2	Shadescale scrub, chaparral, wetland-riparian at 2260 to 5340 feet elevation	Observed during focused surveys. Suitable habitat occurs within the BSA.	Present
Canbya candida White pygmy-poppy	CNPS List 4.2	Creosote bush scrub, Joshua tree woodland at 2290 to 5240 feet elevation	Observed during focused surveys. Suitable habitat occurs within the BSA.	Present
Chorizanthe parryi var. *fernandina* San Fernando Valley Spineflower	FC CE CNPS 1B.1	Coastal sage scrub at 1080 to 3340 feet elevation	Suitable habitat does not occur within the BSA.	Low potential of occurring

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
Cymopterus deserticola Desert cymopterus	CNPS List 1B.2	Loose, sandy soil of flats in old dune areas with well-drained sand in Joshua tree woodland and Mojavean desert scrub at 2,000 to 5,000 feet elevation. Historically distributed from east of Victorville to Muroc and Kramer. Most occurrences located in or near Edwards Air Force Base.	Suitable habitat occurs within the BSA, but the species was not observed during focused surveys. Known range includes southeastern Kern County and west-central San Bernardino County.	Moderate potential of occurring
Dodecahema leptoceras Slender-Horned spineflower	FE CE CNPS 1B.1	Chaparral, coastal sage scrub at 1180 to 2690 feet elevation	Suitable habitat does not occur within the BSA. Focused surveys conducted during drought conditions.	Low potential of occurring
Eremothera boothii ssp. *Boothi*i Booth's evening-primrose	CNPS List 2B.3	Joshua tree woodland and pinyon-juniper woodland at 2,900 to 7,000 feet elevation. In California, known from Inyo, Mono, and San Bernardino Counties.	Observed during focused surveys. Suitable habitat occurs within the BSA.	Present
Erigeron parishii Parish's daisy	FT CNPS 1B.1	Creosote bush scrub and pinyon-juniper woodland at 3970 to 7410 feet elevation	Suitable habitat does occur within the BSA, however, historically distributed south of Lucerne Valley and Johnson valley, at the northern edge of the San Bernardino National Forest.	Low potential of occurring
Eriogonum ovalifolium var. *vineum* Cushenbury	FE CNPS 1B.1	Creosote bush scrub and pinyon-juniper woodland at 4560 to 9900 feet	Suitable habitat does occur within the BSA, however, historically	Low potential of occurring

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
buckwheat		elevation	distributed south of Lucerne Valley and Johnson valley, at the northern edge of the San Bernardino National Forest.	
Loeflingia squarrosa var. *artemisiarum* Sagebrush loeflingia	CNPS List 2B.2	Sandy dunes and flats in creosote bush scrub and sagebrush scrub at 3,500 to 4,000 feet elevation. In California, known from Los Angeles, Ventura, Lassen, and San Bernardino Counties.	Suitable habitat does not occur within the BSA. In California, known from Los Angeles, Ventura, Lassen, and San Bernardino counties.	Low potential of occurring
Mimulus mohavensis Mojave monkeyflower	CNPS List 1B.2	Gravelly banks of desert washes; 1,900 to 3,900 feet elevation. Known only from around Barstow in the Mojave Desert.	Suitable habitat occurs within the BSA, but the species was not observed during focused surveys. Known range includes northeastern Los Angeles County and west-central/central San Bernardino County.	Moderate potential of occurring
Muilla coronata Crowned muilla	CNPS List 4.2	Occurs in heavy soils of chenopod scrub, Joshua tree woodland, Mojavean desert scrub, at 2,510 to 6,430 feet.	Observed during focused surveys. Suitable habitat occurs within the BSA.	Present
Navarretia fossalis Spreading navarretia	FT CNPS 1B.1	Shadescale scrub, freshwater-marsh, wetland-riparian, vernal-pools at 290 to 3510 feet elevation	Suitable habitat does occur within the BSA, however, known populations only exist in California from western Los Angeles, Riverside, and San Diego counties. Focused surveys conducted	Low potential of occurring

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
			during drought conditions.	
Nemacladus secundiflorus var. *robbinsii* Robbins' nemacladus	CNPS List 1B.2	Chaparral, valley and foothill grasslands at 1140 to 5570 feet elevation	Suitable habitat does not occur within the BSA.	Low potential of occurring
Opuntia basilaris var. *brachyclada* Short-joint beavertail	CNPS List 1B.2	Sandy soil or coarse, granitic loam in chaparral, Joshua tree woodland, Mojavean desert scrub, and pinyon-juniper woodland, at 1,400 to 5,900 feet elevation. Known only from Los Angeles and San Bernardino Counties. Historically distributed on the desert slopes of the San Gabriel and San Bernardino Mountains, and also the Providence Mountains.	Suitable habitat occurs within the BSA, but the species was not observed during focused surveys. Historically distributed on the desert slopes of the San Gabriel and San Bernardino mountains, and also the Providence Mountains.	Low potential of occurring
Orcuttia californica California Orcutt grass	FE CE CNPS 1B.1	Valley grassland, freshwater wetlands, wetland-riparian at 190 to 2160 feet elevation	Suitable habitat does not occur within the BSA.	Low potential of occurring
Oxytheca parishii var. *goodmaniana* Cushenbury oxytheca	FE CNPS 1B.1	Pinyon-juniper woodland at 4460 to 8130 feet elevation	Suitable habitat does occur within the BSA, however, historically distributed south of Lucerne Valley and Johnson valley, at the northern edge of the San Bernardino National Forest.	Low potential of occurring
Pediomelum castoreum Beaver Dam breadroot	CNPS List 1B.2	Creosote bush scrub, Joshua tree woodland at 1960 to 3110 feet	Suitable habitat occurs within the BSA, but the species was not	Moderate potential of occurring

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
		elevation	observed during focused surveys. Known range includes central Inyo County and west-central/central/northern San Bernardino County. Focused surveys conducted during drought conditions.	
Plagiobothrys parishii Parish's popcornflower	CNPS List 1B.1	Joshua tree woodland, wetland-riparian at 2850 to 7150 feet elevation	Suitable habitat does occur within the BSA, however, within San Bernardino County, historically isolated to one location in Lucerne Valley. Focused surveys conducted during drought conditions.	Low potential of occurring
Sclerocactus polyancistrus Mojave fish-hook cactus	CNPS List 4.2	Creosote bush scrub and Joshua tree woodland at 2460 to 7610 feet elevation	Observed during focused surveys. Suitable habitat occurs within the BSA.	Present
Scutellaria bolanderi ssp. *austromontana* Southern mountains skullcap	CNPS List 1B.2	Chaparral, foothill woodland, yellow pine forest, wetland riparian, at 1930 to 7840 feet elevation	Suitable habitat does not occur within the BSA. Extant (and recent) populations mostly known for Riverside and San Diego counties.	Low potential for occurring
Symphyotrichum defoliatum San Bernardino aster	CNPS List 1B.2	Grasslands and meadows at 30 to 6290 feet elevation	Suitable habitat occurs within the BSA, but the species was not observed during focused surveys. Known range includes San Luis Obispo, Santa Barbara, Kern, Los Angeles, Orange, San Diego, Riverside and San	Moderate potential of occurring

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
			Bernardino counties; the majority of Mojave Desert occurrences recorded are from southwestern San Bernardino County. Focused surveys conducted during drought conditions.	
INVERTEBRATES				
Branchinecta lynchi Vernal Pool fairy shrimp	US: FT	Restricted to vernal pools, and on occasion artificial pools created by roadside ditches.	Suitable habitat not present.	Not expected to occur and therefore no-effect on species.
Streptocephalus woottoni Riverside fairy shrimp	US: FE	Restricted to deep vernal pools and ponds with chemistry and temperature conditions specific to nonmarine and nonriverine waters. Vernal pool habitat lies within annual grasslands, which may be interspersed with chaparral or coastal sage scrub vegetation.	Suitable habitat not present.	Not expected to occur and therefore no-effect on species.
FISHES				
Gila bicolor ssp. *Mohavensis* Mohave Tui chub	US: FE CA: SE	Historically occurred within the Mojave River, associated with deep pools and sloughs of the river. This species does not currently occupy the Mojave river, but a few perennial stretches of the river remain that could support the species. Current populations are	Potentially suitable habitat present in few areas of the Mojave River.	Not expected to occur and therefore no-effect on species.

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
		located in man-made or man-supported habitats.		
AMPHIBIANS				
Anaxyrus californicus Arroyo toad	US: FE CDFW: SSC	Washes and arroyos with open water; sand or gravel beds; for breeding, pools with sparse overstory vegetation. Coastal and a few desert streams from Santa Barbara County to Baja California.	Suitable habitat not present during site visits. Project limits not within species range.	Not expected to occur and therefore no-effect on species. CNDDB records indicate extirpated from Mojave River region.
Rana draytoniil California red-legged frog	US: FT	Occurs in or near quiet permanent water of streams, marshes, ponds, and lakes. Individuals may range far from water along riparian corridors and in damp thickets and forests.	Suitable habitat not present during site visits. Project limits not within species range.	Not expected to occur and therefore no-effect on species. CNDDB records indicate extirpated from Mojave River region.
Rana muscosa Mountain yellow-legged frog	US: FE	Habitat includes sunny riverbanks, meadow streams, isolated pools, and lake borders in the Sierra Nevada, rocky stream courses in southern California. Prefers sloping banks with rocks or vegetation to the water's edge. USFWS concluded this species requires water source found between 1210 - 7540 feet elevation that are permanent	Suitable habitat not present during site visits. Project limits not within species range.	Not expected to occur and therefore no-effect on species.
REPTILES				
Anniella pulchra	CDFW:	Occurs in moist	Suitable habitat	High potential for

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
pulchra Silvery legless lizard	SSC USFS: S	warm loose soil with plant cover. Occurs in sparsely vegetated areas of beach dunes, chaparral, pine-oak woodlands, desert scrub, sandy washes, and stream terraces with sycamores, cottonwoods, or oaks. Found from 0 to 5,900 feet elevation	present. Known to occur in vicinity of project.	occurrence.
Emys marmorata (*Actinemys marmorata*) Western pond turtle	CDFW: SSC BLM: S USFS: S	Occur in permanent and intermittent waters, including marshes, streams, rivers, ponds, and lakes. They favor habitats with large numbers of emergent logs or boulders, where they aggregate to bask.	No suitable habitat present during site visits. Presumed extirpated from vicinity of project.	Not expected to occur and therefore no-effect on species.
Gopherus agassizii Desert tortoise	US: FT CA: ST	Historically found throughout the Mojave and Sonoran Deserts into Arizona, Nevada, and Utah. Occurs throughout the Mojave Desert in scattered populations. Found in creosote bush scrub, saltbush scrub, thornscrub (in Mexico), and Joshua tree woodland. Found in the open desert as well as in oases, riverbanks, washes, dunes, and occasionally rocky slopes.	Suitable habitat present.	Present. Observed during focused surveys.

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
Phrynosoma blainvillii Coast horned lizard	CDFW: SSC BLM: S USFS: S	Occurs in annual grassland, coastal sage scrub, chaparral, and woodland communities. Prefers open country, especially sandy areas, washes, and floodplains. Requires open areas for sunning, bushes for cover, patches of loose soil for burial, and an abundant supply of ants or other insects. Occurs in Siskiyou County, in the Central Valley and adjacent foothills below 4,000 feet elevation, in coastal areas of central California, and in non-desert areas of southern California below 6,000 feet elevation, and in Baja California, Mexico.	Suitable habitat present.	Present. Observed during focused surveys.
Uma scoparia Mohave fringe-toed lizard	CDFW: SSC	Sparesly-vegetated arid areas with fine sand for burrowing. Dune	Suitable habitat is not present.	Not expected to occur and therefore no-effect on species.
BIRDS				
Accipiter cooperii Cooper's hawk	CDFW: WL	Woodland and semi-open habitats, riparian groves and mountain canyons. Uncommon permanent resident in coastal, mountains, and deserts of southern California. Transients fairly	Suitable foraging habitat present. Observed within BSA.	Present. Observed during site visits.

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
		common on coast in fall.		
Agelaius tricolor Tricolored blackbird	CDFW: SSC BLM: S	Lowland species, breeding in freshwater marshes with tall emergent vegetation, in upland habitats (especially thickets of non-native Himalayan blackberry), and in silagefields. Forages in agricultural areas where livestock is present and grass is short.	Suitable habitat present.	Present. Observed during site visits.
Aquila chrysaetos Golden eagle	CDFW: FP BLM: S	Wide range of flat or mountainous, largely open habitats, often above the tree line from seal level to 13100 feet elevation.	Suitable foraging habitat present. Observed near BSA.	Present. Observed during site visits.
Buteo regalis Ferruginous Hawk	CDFW: WL	Typically breeds in arid and open landscapes dominated by grass or shrubs no more than 6500 feet elevation	Suitable foraging habitat present.	Not observed during focused raptor surveys. Not expected to occur.
Circus cyaneus Northern harrier	CDFW: SSC	Coastal salt and fresh water marsh. Nest and forages in grassland from saltgrass in desert sink to mountain cienagas. Also nests on ground in shrubby vegetation.	Suitable foraging habitat present.	Present. Observed during site visits.
Athene cunicularia Burrowing owl	CDFW: SSC BLM: S	Usually occupies ground squirrel burrows in open, dry grasslands, agricultural and range lands,	Suitable nesting and foraging habitat present. Observed during site surveys.	Present. Observed during site visits.

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
		railroad rights-of-way, margins of highways, golf courses, and airports. Resident over most of southern California (sparsely distributed over desert areas).		
Asio flammeus Short-eared owl	CDFW: SSC	Found in fresh and salt swampland, lowland meadows, and irrigated alfalfa fields. Nests on dry ground concealed by vegetation.	Suitable foraging habitat present.	Present. Observed during site visits
Asio otus Long-eared owl	CDFW: SSC	Forest and shrublands near open areas	Suitable habitat present. Observed during site surveys	Present. Observed during site visits.
Buteo swainsoni Swainson's hawk	CA: ST	Open and semi-open country within deserts, grasslands and prairies	Suitable foraging habitat present. None observed during site visits.	Moderate potential for occurrence.
Charadrius montanus Mountain plover	CDFW: SSC BLM: S (Overwintering sites are protected in CA.)	Nests in heavily grazed, shortgrass prairie, xeric scrub and fallow fields. A dietary generalist in winter when it inhabits semi-desert, dry, bare agricultural land and breeding-type habitats.	Suitable habitat present. None observed during site visits.	High Potential for occurrence.
Coccyzus americanus occidentalis Western yellow-billed cuckoo	US: Threatened CA: SE BLM: S (Nesting sites are protected.)	Riparian obligate species primarily with willow-cottonwood riparian forests, but other species occur in alder and box elder dominated riparian habitats	Suitable habitat present. None observed during site visits.	Moderate potential for occurrence.
Empidonax trailii extimus Southwestern willow	US: FE CA: SE	Breeds and nests in riparian forest with dense understory. Rare and local in	Suitable habitat in Mojave River.	Present. Observed in Mojave River during focused surveys.

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
flycatcher		southern California.		
Falco mexicanus Prairie falcon	CDFW: WL	Nests in cliffs or rocky outcrops; forages in open arid valleys and agricultural fields. Throughout the desert and arid interior portions of coastal countries. Uncommon resident in southern California.	Suitable foraging habitat present. None observed during site visits.	Potential for occurrence.
Gymnogyps californianus California condor	US: FE	Range includes rocky, open-country scrubland, coniferous forest and oak savanna. Cliffs, rocky outcrops or large trees are used as nest sites.	None observed during site visits. Project site is outside CA DF&W designated California condor range.	Not expected to occur and therefore no-effect on species.
Icteria virens Yellow-breasted chat	CDFW: SSC	Found in dense second-growth, riparian thickets and brush. Also found in abandoned farmland and other rural areas where overgrown vegetation proliferates	Suitable habitat present in Mojave River. None observed during site visits.	Moderate potential for occurrence.
Lanius ludovicianus Loggerhead shrike	CDFW: SSC	Semi-open areas, nesting in trees and shrubs.	Suitable habitat present.	Present. Observed during site visits.
Piranga rubra Summer tanager	CDFW: SSC	Occur along streams among willows, cottonwoods, mesquite, or saltcedar	Suitable habitat in Mojave River.	Present. Observed in Mojave River during site visits.
Toxostoma lecontei Le Conte's thrasher	CDFW: SSC	Inhabits sparsely vegetated desert flats, dunes, alluvial fans, or gently rolling hills having a	Suitable habitat present.	Present. Observed during focused surveys.

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
		high proportion of saltbush (Atriplex spp.) or cholla (cylindrical Opuntia spps.), often occurring along small washes or sand dunes. Prefers dense thorny shrubs (most often saltbush or cholla) for nesting. Uncommon and local resident in low desert scrub throughout most of the Mojave Desert. Breeding range into eastern Mojave,		
Vireo bellii pusillus Least Bell's vireo	US: FE CA: SE	Riparian forests and willow thickets. Breeds and nests only in southwestern California; winters in Baja California.	Suitable habitat present.	Present. Observed during focused surveys.
Setophaga petechia Yellow warbler	CA: SSC	Riparian plant associations, prefer willows, cottonwood, aspen, sycamore and alder trees for nesting and foraging.	Suitable habitat in Mojave River.	Present. Observed in Mojave River during site visits.
MAMMALS				
Corynorhinus townsendii Townsend's big-eared bat	CA: CT CDFW: SSC BLM: S USFS: S	Coniferous forests and woodlands, semi-desert and montane shrublands	Suitable habitat is present.	Moderate potential for occurance.
Chaetodipus fallax pallidus Pallid San Diego pocket mouse	CDFW: SSC	Found in sandy herbaceous areas, usually associated with rocks or coarse gravel in desert	Suitable habitat is present however the project limit is outside known range.	Not expected to occur and therefore no-effect on species.

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
		wash, desert scrub, desert succulent scrub, pinyon-juniper woodlands, etc. in desert border areas in eastern San Diego County.		
Dipodomys merriami parvus San Bernardino kangaroo rat	US: FE	Inhabits sandy loam substrates, characteristic of alluvial fans and flood plains. Surrounding vegetation is dominated by chaparral and coastal sage scrub.	Suitable habitat not present. Project limit is outside known range.	Not expected to occur and therefore no-effect on species.
Eumops perotis californicus Western mastiff bat	CDFW: SSC BLM: S	Primarily cliff-dwelling mammal that occurs in a dry desert washes, flood plains, chaparral, oak woodlands, open ponderosa pine forests, grasslands and montane meadows.	Suitable habitat present. Foraging habitat present.	Moderate potential for occurrence.
Lasiurus cinereus Hoary bat	WBWG: M	Normally roosts in trees, hidden in the foliage, preferring woodland, and coniferous forests	Suitable habitat not present.	Not expected to occur and therefore no-effect on species.
Microtus californicus mohavensis Mojave river vole	CDFW: SSC	Weedy herbaceous growth in wet areas along the Mojave River, and possibly in some nearby irrigated pastures.	Suitable habitat present.	Moderate potential for occurrence.
Myotis yumanensis Yuma myotis	BLM: S WBWG: LM	Occasionally roosting in mines or caves, but often found in buildings or bridges. Bachelors sometimes roost in abandoned cliff swallow nests.	Suitable foraging habitat present.	Moderate potential for occurrence.

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
Neotoma lepida intermedia San Diego desert woodrat	CDFW: SSC	Found in southern California inhabiting Joshua tree, pinyon-juniper, mixed and chamise-redshank chaparral, sagebrush, and most desert habitats. Nest middens are built against a rock crevice, at the base of creosote or cactus or in the lower branches of trees	Suitable habitat present.	Present. Observed during MGS trapping surveys.
Onychomys torridus ramona Southern grasshopper mouse	CDFW: SSC	Found in scrub habitats with friable soils for digging, with low to moderate shrub cover, including habitats such as coastal sage scrub, mixed chaparral, low sagebrush, riparian scrub, and annual grassland with scattered scrubs.	No observation recently within vicinity of project. Suitable habitat not present.	Not expected to occur and therefore no-effect on species.
Perognathus inornatus inornatus San Joaquin pocket mouse	BLM: S	Inhabits dry, open, grassy or weedy ground, and arid annual grasslands, savanna, and desert-shrub associations with sandy washes or finely textured soil.	No observation recently within vicinity of project. Suitable habitat not present. Outside known range. Presumed extirpated in vicinity of project.	Not expected to occur and therefore no-effect on species.
Taxidea taxus American badger	CDFW: SSC	Prefers open areas and may frequent brushlands with little groundcover. Inhabits regions ranging from below sea level to elevations upwards of 11,800 feet.	Suitable habitat present.	Present. Observed during site visits.

Scientific Name Common Name	Status	Habitat Requirements	Rationale	Potential for Occurrence
Xerospermophilus mohavensis Mohave ground squirrel	CA: ST	Occupies creosote bush scrub, saltbush scrub, and Joshua tree woodland type plant communities. This species is found in open areas of sandy and gravelly soils devoid of rocky areas in the eastern and northern parts of the Mojave Desert region.	Potential suitable habitat present.	Low potential for occurrence. Not detected during investigative surveys.

Designations:

US: United States
CA: California
FE – Federally Endangered
FT – Federally Threatened
SE – State Endangered
ST – State Threatened
CT – Candidate Threatened

CDFW: SSC – Species of Special Concern
CDFW: FP – Fully Protected
CDFW: WL – Watch List
BLM: S – Sensitive
USFS: S – Sensitive
WBWG: M – Medium Priority

Chapter 4. Results: Biological Resources, Discussion of Impacts and Mitigation

4.1. Plant Communities

4.1.1. Discussion of Plant Communities

4.1.1.1. SURVEY RESULTS

The BSA is approximately 8,459 acres in size including 36 different plant communities and land cover types, all of which would be impacted with the implementation of the proposed project. Impacts to all plant communities are shown in Table 5. A separate discussion of special-status communities (Joshua tree Woodland, black willow thickets, Fremont cottonwood forest, red willow thickets, sandbar willow thickets, and scale broom scrub) is discussed further below. Impacts to non-special status plant communities are not considered substantial; therefore, only impacts to special-status plant communities are being carried forward for further discussion.

Temporary impacts during construction will occur along the road shoulder and graded slopes. This area is expected to be re-vegetated with similar plant communities to minimize the loss of each community.

To further minimize impacts, it is understood that the elevation of the highway will be kept to a minimum necessary for drainage to reduce the overall footprint due to required shoulder sloping. Another issue that must be considered when determining elevation of roadway, however, is necessary height of drainage culverts, which act as wildlife crossings. The higher the culvert, the higher elevation of the roadway and in turn the greater the footprint of impact to plant communities. These two opposing matters must be balanced when considering final design.

Tables 5 and 6 below present permanent and temporary impact calculations to natural plant communities for variations for the Freeway/Expressway, Freeway/Tollway, Freeway/Expressway with High Speed Rail, and Freeway/Tollway with HSR alternatives. Within the tables, it should be noted that all areas designated as “Main Alignment/Common Areas” are all areas of highway or highway and rail, except where a proposed variation occurs. Within the proposed variation, there is

either the Main option, or a variation, i.e. Main A, or Variation A. See Summary Plant Community Map within Appendix C for further detail.

Although impacts to each of the individual undisturbed natural plant communities noted within the table could be considered small when compared to the total amount within the greater Mojave desert, when added, the total amount could be considered substantial when compared to similar habitat within the Antelope and Victor Valleys. To reduce the impact to natural plant communities as a result of converting to an unnatural condition, mitigation measure MM-3 is proposed. With the implementation of measure MM-3 impacts to undisturbed plant communities would be reduced to a level less than substantial.

Table 5a: Impacts to Plant Communities for Variations of Freeway/Expressway (Freeway/Tollway) (in acres)

Plant Community/Land Cover	Main Alignment/ Common Areas		Main A		Variation A		Main D		Variation D	
	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact
Agriculture	112.09	51.65	3.80	0.50	-	-	-	-	-	-
Allscale scrub Alliance	133.04	60.09	-	-	-	-	-	-	-	-
Big sagebrush Alliance	-	6.60	-	-	-	-	-	-	-	-
Black willow thickets	-	0.79	-	-	-	-	-	-	-	-
California buckwheat scrub Alliance	-	-	-	-	-	-	-	-	-	-
California bulrush-American bulrush marsh	-	-	-	-	-	-	-	-	-	-
Cheesebush scrub Alliance	-	-	-	-	-	-	-	-	-	-
Creosote bush scrub Alliance	429.52	357.70	-	-	-	-	155.00	116.43	199.24	142.74
Creosote bush scrub/allscale scrub Alliance	-	-	-	-	-	-	-	-	-	-
Creosote bush scrub/white bursage scrub series	-	-	-	-	-	-	0.02	0.03	0.10	0.29
Developed	127.50	64.66	51.44	10.98	38.15	9.11	14.93	6.45	10.11	2.32
Disturbed	150.81	74.76	13.26	9.21	28.13	21.92	3.76	1.71	7.02	2.33
Disturbed Allscale scrub Alliance	42.56	15.38	-	-	-	-	-	-	-	-
Disturbed Black willow thickets	-	-	1.14	0.20	3.34	0.66	-	-	-	-
Disturbed Creosote bush scrub Alliance	26.39	18.95	-	-	-	-	35.84	9.22	4.80	1.26
Disturbed Fourwing saltbush scrub Alliance	47.80	39.13	-	-	-	-	-	-	-	-
Disturbed Joshua tree woodland Alliance	-	-	27.24	11.53	28.16	12.24	-	-	-	-
Disturbed Rubber rabbitbrush scrub Alliance	12.96	25.88	126.39	60.85	109.04	46.39	-	-	-	-

Table 5b: Impacts to Plant Communities for Variations of Freeway/Expressway and Freeway/Tollway (in acres)

Plant Community/Land Cover	Main Alignment/ Common Areas		Main A		Variation A		Main D		Variation D	
	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact
Disturbed Salt grass flats Alliance	6.87	1.85	-	-	-	-	-	-	-	-
Disturbed White bursage scrub Alliance	-	-	-	-	-	-	-	-	-	-
Fourwing saltbush scrub Alliance	82.49	56.09	23.54	3.87	28.34	5.13	15.36	11.44	2.44	2.12
Fremont cottonwood forest Alliance	5.15	4.48	-	-	-	-	-	-	-	-
Joshua tree woodland Alliance	153.77	54.70	78.45	23.36	87.30	24.83	-	-	-	-
Mojave yucca scrub Alliance	7.98	0.41	-	-	-	-	-	-	-	-
Nevada joint fir scrub	-	-	-	-	-	-	-	-	-	-
Non-native grassland	9.22	5.55	-	-	-	-	-	-	-	-
Red brome grasslands	3.51	1.90	-	-	-	-	0.32	0.15	0.33	0.14
Red willow thickets	-	-	-	-	-	-	-	-	-	-
Rock outcrop	0.37	4.70	-	-	-	-	-	-	-	-
Rubber rabbitbrush scrub Alliance	7.95	14.72	0.58	0.16	0.16	-	-	-	-	-
Sandbar willow thickets Alliance	-	-	-	-	-	-	-	-	-	-
Scale broom scrub Alliance	2.20	12.86	-	-	-	-	-	-	-	-
Southern cattail marsh	-	-	-	-	-	-	-	-	-	-
Unvegetated wash	-	1.47	-	-	-	-	-	-	-	-
White bursage scrub Alliance	2.22	0.97	-	-	-	-	-	-	-	-
Windrow	-	-	0.59	-	0.90	-	-	-	-	-

Table 5c: Impacts to Plant Communities for Variations of Freeway/Expressway and Freeway/Tollway (in acres)

Plant Community/Land Cover	Main B		Variation B		Variation B1		Main E		Variation E	
	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact
Agriculture	6.89	2.90	-	-	-	-	-	-	-	-
Allscale scrub Alliance	-	-	-	-	-	-	18.65	5.50	4.80	8.96
Big sagebrush Alliance	-	-	-	-	-	-	-	-	-	-
Black willow thickets	-	-	-	-	-	-	-	-	-	-
California buckwheat scrub Alliance	-	-	-	-	-	-	-	-	-	-
California bulrush-American bulrush marsh	-	-	-	-	-	-	-	-	0.15	0.19
Cheesebush scrub Alliance	-	-	-	-	-	-	-	-	-	-
Creosote bush scrub Alliance	241.76	160.27	292.20	229.95	204.15	155.51	187.61	60.30	116.65	128.86
Creosote bush scrub/allscale scrub Alliance	-	-	-	-	-	-	0.09	0.18	0.02	0.04
Creosote bush scrub/white bursage scrub series	-	-	-	-	-	-	-	-	-	-
Developed	23.32	9.40	8.68	3.03	31.53	10.84	66.25	12.54	51.73	68.81
Disturbed	29.79	21.37	9.68	6.49	11.71	8.22	34.80	9.26	13.96	9.71
Disturbed Allscale scrub Alliance	-	-	-	-	-	-	5.48	0.19	4.75	11.38
Disturbed Black willow thickets	-	-	-	-	-	-	-	-	-	-
Disturbed Creosote bush scrub Alliance	25.79	26.88	6.11	4.38	74.72	50.93	11.42	5.22	25.35	45.35
Disturbed Fourwing saltbush scrub Alliance	-	-	-	-	-	-	-	-	-	-
Disturbed Joshua tree woodland Alliance	-	-	-	-	-	-	4.45	3.14	-	0.01
Disturbed Rubber rabbitbrush scrub Alliance	-	-	-	-	-	-	-	-	-	-

Table 5d: Impacts to Plant Communities for Variations of Freeway/Expressway and Freeway/Tollway (in acres)

Plant Community/Land Cover	Main B		Variation B		Variation B1		Main E		Variation E	
	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact
Disturbed Salt grass flats Alliance	-	-	-	-	-	-	-	-	-	-
Disturbed White bursage scrub Alliance	-	-	-	-	-	-	26.14	9.57	-	-
Fourwing saltbush scrub Alliance	-	-	-	-	-	-	3.10	5.49	0.38	0.20
Fremont cottonwood forest Alliance	-	-	-	-	-	-	2.15	0.71	0.24	0.48
Joshua tree woodland Alliance	-	0.07	-	0.04	-	0.05	-	-	-	-
Mojave yucca scrub Alliance	-	-	-	-	-	-	1.23	0.06	-	-
Nevada joint fir scrub	-	-	-	-	-	-	-	-	-	-
Non-native grassland	-	-	-	-	-	-	0.08	-	-	-
Red brome grasslands	-	-	-	-	-	-	-	-	-	-
Red willow thickets	-	-	-	-	-	-	-	-	-	-
Rock outcrop	-	-	-	-	-	-	2.27	0.93	1.27	1.79
Rubber rabbitbrush scrub Alliance	-	-	-	-	-	-	-	-	-	-
Sandbar willow thickets Alliance	-	-	-	-	-	-	-	-	0.79	0.70
Scale broom scrub Alliance	-	-	-	-	-	-	-	-	-	-
Southern cattail marsh	-	-	-	-	-	-	-	-	0.22	0.29
Unvegetated wash	-	-	-	-	-	-	-	0.19	0.56	1.18
White bursage scrub Alliance	9.58	7.98	12.19	9.78	10.14	7.75	5.92	0.17	1.88	2.41
Windrow	-	-	-	-	-	-	-	-	-	-

Table 6a: Impacts to Plant Communities for Variations of Freeway/Expressway with High Speed Rail and Freeway/Tollway with HSR (in acres)

Plant Community/Land Cover	Main Alignment/ Common Areas		Main D		Variation D	
	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact
Agriculture	145.95	28.85	4.65	1.10	7.01	0.16
Allscale scrub Alliance	144.54	59.53	-	-	-	-
Big sagebrush Alliance	-	6.60	-	-	-	-
Black willow thickets	-	0.79	-	-	-	-
California buckwheat scrub Alliance	-	-	-	-	-	-
California bulrush-American bulrush marsh	-	-	-	-	-	-
Cheesebush scrub Alliance	2.14	-	-	-	-	-
Creosote bush scrub Alliance	465.90	233.09	235.82	50.70	327.97	29.40
Creosote bush scrub/allscale scrub Alliance	-	-	-	-	-	-
Creosote bush scrub/white bursage scrub series	-	-	-	0.05	-	-
Developed	204.91	59.67	16.98	2.49	11.26	1.63
Disturbed	209.96	45.13	16.07	1.99	26.09	0.84
Disturbed Allscale scrub Alliance	42.56	15.38	-	-	-	-
Disturbed Black willow thickets	2.11	0.07	-	-	-	-
Disturbed Creosote bush scrub Alliance	33.48	5.85	34.11	12.99	4.08	1.07
Disturbed Fourwing saltbush scrub Alliance	89.73	4.71	-	-	-	-
Disturbed Joshua tree woodland Alliance	39.57	6.19	-	-	-	-
Disturbed Rubber rabbitbrush scrub Alliance	215.19	62.94	-	-	-	-
Disturbed Salt grass flats Alliance	6.87	1.85	-	-	-	-
Disturbed White bursage scrub Alliance	-	-	-	-	-	-
Fourwing saltbush scrub Alliance	159.92	52.89	22.58	4.91	5.25	0.38

Plant Community/Land Cover	Main Alignment/ Common Areas		Main D		Variation D	
	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact
Fremont cottonwood forest Alliance	0.08	9.55	-	-	-	-
Joshua tree woodland Alliance	317.18	44.91	-	-	-	-
Mojave yucca scrub Alliance	15.06	3.25	-	-	-	-
Nevada joint fir scrub	-	-	-	-	-	-
Non-native grassland	12.02	2.75	-	-	-	-
Red brome grasslands	-	-	5.18	0.7	6.22	-
Red willow thickets	-	-	-	-	-	-
Rock outcrop	0.40	4.46	-	-	-	-
Rubber rabbitbrush scrub Alliance	14.99	8.79	-	-	-	-
Sandbar willow thickets Alliance	-	-	-	-	-	-
Scale broom scrub Alliance	3.78	20.47	-	-	-	-
Southern cattail marsh	-	-	-	-	-	-
Unvegetated wash	-	1.39	-	-	-	-
White bursage scrub Alliance	-	-	-	-	-	-
Windrow	0.59	-	-	-	-	-

Table 6b: Impacts to Plant Communities for Variations of Freeway/Expressway with High Speed Rail and Freeway/Tollway with HSR (in acres)

Plant Community/Land Cover	Main B		Variation B		Variation B1		Main E		Variation E	
	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact
Agriculture	9.01	3.51	-	-	-	-	-	-	-	-
Allscale scrub Alliance	-	-	-	-	-	-	14.88	7.61	9.40	10.70
Big sagebrush Alliance	-	-	-	-	-	-	-	-	-	-
Black willow thickets	-	-	-	-	-	-	-	-	-	-
California buckwheat scrub Alliance	-	-	-	-	-	-	-	-	-	-
California bulrush-American bulrush marsh	-	-	-	-	-	-	-	-	0.23	0.11
Cheesebush scrub Alliance	-	-	-	-	-	-	-	-	-	-
Creosote bush scrub Alliance	388.63	93.74	480.95	120.40	374.37	65.61	244.84	183.28	287.92	138.11
Creosote bush scrub/allscale scrub Alliance	-	-	-	-	-	-	0.09	0.18	0.03	0.03
Creosote bush scrub/white bursage scrub series	-	-	-	-	-	-	-	-	-	-
Developed	29.45	10.38	10.92	0.99	40.45	2.23	79.39	13.94	91.99	65.87
Disturbed	39.85	13.52	10.80	2.23	18.48	1.16	46.40	15.59	26.42	9.04
Disturbed Allscale scrub Alliance	-	-	-	-	-	-	3.99	0.37	10.18	14.13
Disturbed Black willow thickets	-	-	-	-	-	-	-	-	-	-
Disturbed Creosote bush scrub Alliance	43.26	9.74	2.23	0.12	121.51	15.54	12.63	3.77	38.15	48.53
Disturbed Fourwing saltbush scrub Alliance	-	-	-	-	-	-	-	-	-	-
Disturbed Joshua tree woodland Alliance	-	-	-	-	-	-	6.35	1.24	-	-
Disturbed Rubber rabbitbrush scrub Alliance	-	-	-	-	-	-	-	-	2.63	-

Table 6c: Impacts to Plant Communities for Variations of Freeway/Expressway with High Speed Rail and Freeway/Tollway with HSR (in acres)

Plant Community/Land Cover	Main B		Variation B		Variation B1		Main E		Variation E	
	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact
Disturbed Salt grass flats Alliance	-	-	-	-	-	-	-	-	-	-
Disturbed White bursage scrub Alliance	-	-	-	-	-	-	44.58	13.50	-	-
Fourwing saltbush scrub Alliance	-	-	-	-	-	-	3.35	6.15	0.38	0.15
Fremont cottonwood forest Alliance	-	-	-	-	-	-	3.60	0.74	2.49	0.29
Joshua tree woodland Alliance	6.07	2.71	6.17	3.41	7.30	1.44	13.54	5.83	9.82	5.08
Mojave yucca scrub Alliance	-	-	-	-	-	-	0.93	0.34	-	-
Nevada joint fir scrub	-	-	-	-	-	-	-	-	-	-
Non-native grassland	-	-	-	-	-	-	0.04	-	-	-
Red brome grasslands	-	-	-	-	-	-	-	-	-	-
Red willow thickets	-	-	-	-	-	-	-	-	1.01	-
Rock outcrop	-	-	-	-	-	-	5.30	1.22	1.27	1.27
Rubber rabbitbrush scrub Alliance	-	-	-	-	-	-	-	-	-	-
Sandbar willow thickets Alliance	-	-	-	-	-	-	-	0.04	0.98	0.40
Scale broom scrub Alliance	-	-	-	-	-	-	-	-	-	-
Southern cattail marsh	-	-	-	-	-	-	-	-	0.22	0.15
Unvegetated wash	-	-	-	-	-	-	-	0.21	5.32	1.65
White bursage scrub Alliance	17.12	2.97	20.21	2.53	18.54	2.54	5.92	1.94	2.82	1.45
Windrow	-	-	-	-	-	-	-	-	-	

Table 6d: Impacts to Plant Communities for Variations of Freeway/Expressway with High Speed Rail and Freeway/Tollway with HSR (in acres)

Plant Community/Land Cover	Option 1A		Option 1B		Option 1C		Option 7A		Option 7B		Option 7C	
	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact
Agriculture	-	-	-	-	-	-	-	-	-	-	-	-
Allscale scrub Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Big sagebrush Alliance	-	0.31	-	0.20	-	0.17	0.94	0.71	1.03	0.71	0.40	0.61
Black willow thickets	-	-	-	-	-	-	-	-	-	-	-	-
California buckwheat scrub Alliance	-	-	-	-	-	-	-	-	-	-	-	-
California bulrush-American bulrush marsh	-	-	-	-	-	-	-	-	-	-	-	-
Cheesebush scrub Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Creosote bush scrub Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Creosote bush scrub/allscale scrub Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Creosote bush scrub/white bursage scrub series	-	-	-	-	-	-	-	-	-	-	-	-
Developed	21.88	19.06	21.77	23.29	16.03	18.15	23.06	30.73	29.68	36.94	21.42	18.13
Disturbed	0.93	2.93	-	3.29	0.26	0.96	2.59	4.97	2.44	5.02	2.34	1.79
Disturbed Allscale scrub Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Disturbed Black willow thickets	-	-	-	-	-	-	-	-	-	-	-	-
Disturbed Creosote bush scrub Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Disturbed Fourwing saltbush scrub Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Disturbed Joshua tree woodland Alliance	-	-	-	-	5.22	2.95	-	-	-	-	8.14	3.13
Disturbed Rubber rabbitbrush scrub Alliance	0.40	17.68	0.03	17.25	-	14.72	9.39	13.78	8.70	12.58	7.92	7.89

Table 6e: Impacts to Plant Communities for Variations of Freeway/Expressway with High Speed Rail and Freeway/Tollway with HSR (in acres)

Plant Community/Land Cover	Option 1A		Option 1B		Option 1C		Option 7A		Option 7B		Option 7C	
	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact
Disturbed Salt grass flats Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Disturbed White bursage scrub Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Fourwing saltbush scrub Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Fremont cottonwood forest Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Joshua tree woodland Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Mojave yucca scrub Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Nevada joint fir scrub	-	-	-	-	-	5.24	-	-	-	-	0.63	18.16
Non-native grassland	-	-	-	-	-	-	-	-	-	-	-	-
Red brome grasslands	-	-	-	-	-	-	-	-	-	-	-	-
Red willow thickets	-	-	-	-	-	-	-	-	-	-	-	-
Rock outcrop	-	-	-	-	-	-	-	-	-	-	-	-
Rubber rabbitbrush scrub Alliance	0.00	9.38	-	8.81		14.10	9.65	29.19	11.95	27.90	12.60	36.65
Sandbar willow thickets Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Scale broom scrub Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Southern cattail marsh	-	-	-	-	-	-	-	-	-	-	-	-
Unvegetated wash	-	-	-	-	-	-	-	-	-	-	-	-
White bursage scrub Alliance	-	-	-	-	-	-	-	-	-	-	-	-
Windrow	-	-	-	-	-	-	-	-	-	-	-	-

4.1.2. Discussion of Joshua Tree Woodland

4.1.2.1. SURVEY RESULTS

A total of 512 acres of Joshua tree woodland and 93 acres of disturbed Joshua tree woodland occurs within the BSA. For specific locations refer to plant community maps located in Appendix C.

Although individual Joshua trees are not considered to be special-status by California Department of Fish and Wildlife, Joshua tree alliances are considered a special-status community. Joshua trees are also important visual features of the Mojave Desert and are protected by several municipal tree protection ordinances. It is estimated that there are 4000-4400 individual Joshua trees within the limits of impact.

This estimate was calculated by counting individual Joshua trees at each of three locations and the average density was then applied to the total amount of disturbed and undisturbed Joshua tree woodland. Representative locations, area, and tree counts are presented below in Table 7. Because of this method used, determining quantity of individual trees for each of the alternatives, variations, and options are proportional to impact area of disturbed and undisturbed Joshua tree woodland.

Table 7: Joshua Tree Density Calculation

Location	Area	No. Trees	Density
East Avenue P-8 at 50th Street East	10 acres	78	7.8 trees/acre
Palmdale Boulevard at 130th Street East	5 acres	21	4.2 trees/acre
Air Expressway at Richardson	10 acres	65	6.5 trees/acre
TOTAL/AVERAGE	25 acres	164	6.6 trees/acre

An additional 10% was included and presented as a range to account for individual trees that occur incidentally within other plant communities. A detailed survey to analyze and inventory each Joshua tree will be conducted after the alignment has been identified and exact impact areas are known.

4.1.2.2. AVOIDANCE AND MINIMIZATION EFFORTS

As stated above, this plant community was identified at the boundaries of the BSA, and therefore there is potential for this area to be preserved in place, since not all of the BSA will be impacted. A biological monitor will be onsite to establish an environmentally sensitive area (ESA) around these areas where this species occurs.

If impacts cannot be avoided, these areas should be included in the calculations for acquisition of land to preserve in perpetuity. To further reduce project impact to this community, individual trees can be translocated to an area that will not be impacted. To aid in revegetation of the finish graded slopes, individual trees can be temporarily located to an onsite nursery and re-planted within revegetation areas.

4.1.2.3. PROJECT IMPACTS

It is assumed at this time that all of this community will be permanently impacted, however it is also noted that some of this community occurs at the outer limits of the proposed project and therefore there is potential for preservation in place.

4.1.2.4. FREEWAY/EXPRESSWAY (FREEWAY/TOLLWAY)

4.1.2.4.1. Main Alignment/Common Areas

Approximately 208 acres of this plant community exist within the main alignment/common areas. Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this plant community will be reduced.

4.1.2.4.2. Main A/Variation A

Approximately 104 acres of this plant community occur within Main A, and approximately 153 acres occur within Variation A. Main A would result in lesser impacts to this plant community in comparison to Variation A. Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this plant community will be reduced.

4.1.2.4.3. Main B/Variation B/Variation B1

Approximately 0.07 acres of this plant community occur within Main B, 0.04 acres occur within Variation B, and 0.05 acres occur within Variation B1. Variation B or Variation B1 would result in lesser impacts to this plant community in comparison to Main B.

4.1.2.4.4. Main D/Variation D

This plant community was not observed in this segment, therefore no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.2.4.5. Main E/Variation E

Approximately 7.59 acres of this plant community occur within Main A, and approximately 0.01 acres occur within Variation E. Variation E would result in lesser impacts to this plant community in comparison to Main E.

4.1.2.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

4.1.2.5.1. Main Alignment/Common Areas

Approximately 407.85 acres of this plant community occur within the main alignment/common areas. Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this plant community will be reduced.

4.1.2.5.2. Main B/Variation B/Variation B1

Approximately 8.78 acres of this plant community occur within Main B, approximately 9.58 acres occur within Variation B, and approximately 8.74 acres occur within Variation B1. Main B or Variation B1 would result in lesser impacts to this plant community in comparison to Variation B.

4.1.2.5.3. Main D/Variation D

This plant community was not observed in this segment, therefore no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.2.5.4. Main E/Variation E

Approximately 26.96 acres of this plant community occur within Main E, and approximately 14.9 acres occur within Variation E. Variation E would result in less impacts to this plant community in comparison to Main E.

4.1.2.6. RAIL OPTIONS 1A, 1B, 1C, 7A, 7B, & 7C

Approximately 8.17 acres of disturbed Joshua tree woodland were observed within Option 1C and 11.27 acres of disturbed Joshua tree woodland were observed within Option 7C. Option 1C would result in less impacts to this plant community in comparison to Option 7C. Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this plant community will be reduced.

This plant community was not observed in the remaining options (1A, 1B, 7A, 7B) and therefore would have no impacts to this plant community.

4.1.2.7. COMPENSATORY MITIGATION

Because this plant community is considered special-status by California Department of Fish & Wildlife, any area to be permanently impacted will be compensated by purchasing land at a 2:1 ratio within the region and preserved in perpetuity.

4.1.2.8. CUMULATIVE IMPACTS

Although there will be impacts to this plant community, implementation of the above-mentioned avoidance and minimization measures and compensatory mitigation will further reduce these impacts. Therefore, no contribution to the cumulative loss of this plant community is expected.

4.1.3. Discussion of Black Willow Thickets

4.1.3.1. SURVEY RESULTS

Approximately 6.72 acres of black willow thickets are located within the BSA. Black willow thickets occur near the Mojave River.

4.1.3.2. AVOIDANCE AND MINIMIZATION EFFORTS

As stated above, this plant community was identified within the Mojave River. As such, there is potential for impacts to this area to be limited with the design of a span bridge over the river with no footings within the river. A biological monitor will be onsite to establish an environmentally sensitive area (ESA) around the area within the Mojave River.

4.1.3.3. PROJECT IMPACTS

As stated above, this plant community was noted within the Mojave River. Because the proposed roadway is expected to be spanning the river on a bridge with no footings within the river, no direct impacts to this plant community are expected to occur.

No shadowing effects (indirect impact), from bridge and abutment structures, to riparian vegetation is anticipated. For a detailed discussion on shading effects please see Section 4.9.7. As previously stated, the proposed roadway is expected to be span the Mojave River on a bridge with no footings within the river and with three separate bridge decks (one each for eastbound and westbound traffic and one for rail travel) at least 80 ft (24 m) above the ground. The height and design of the three narrow bridge decks will allow ample sunlight to reach the areas below the bridge. Therefore, shading impacts on riparian vegetation are not expected.

4.1.3.4. FREEWAY/EXPRESSWAY (FREEWAY/TOLLWAY)

4.1.3.4.1. Main Alignment/Common Areas

Approximately 0.79 acres of black willow thickets exist within the main alignment/common areas. Through implementation of the above avoidance and minimization measures, impacts to this plant community will be avoided.

Main A/ Variation approximately 1.34 acres of disturbed black willow thickets occurs within Main A. Approximately 4 acres of disturbed black willow thickets occurs within Variation A. Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this plant community will be avoided.

4.1.3.4.2. Main B/Variation B/Variation B1

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.3.4.3. Main D/Variation D

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.3.4.4. Main E/Variation E

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.3.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

4.1.3.5.1. Main Alignment/Common Areas

Approximately 2.97 acres of black willow thickets occur within the main alignment/common areas. Through implementation of the above avoidance and minimization measures, impacts to this plant community would be avoided.

4.1.3.5.2. Main B/Variation B/Variation B1

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.3.5.3. Main D/Variation D

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.3.5.4. Main E/Variation E

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.3.6. RAIL OPTION 1A, 1B, 1C, 7A, 7B, & 7C

This plant community was not observed in these segments; therefore, no impacts to this plant community would occur with the implementation of the proposed project for any of these segments.

4.1.3.7. COMPENSATORY MITIGATION

No impacts to this special-status plant community would occur. Therefore, no compensatory mitigation is required.

4.1.3.8. CUMULATIVE IMPACTS

No impacts to this special-status plant community would occur. Therefore, no cumulative impacts would occur.

4.1.4. Discussion of Fremont Cottonwood Forest

4.1.4.1. SURVEY RESULTS

Approximately 21.38 acres of Fremont cottonwood forest are located within the BSA. This plant community mainly occurs near the Mojave River.

4.1.4.2. AVOIDANCE AND MINIMIZATION EFFORTS

As stated above, this plant community was identified within the Mojave River. As such, there is potential for impacts to this area to be limited with the design of a span bridge over the river with no footings within the river. A biological monitor will be onsite to establish an environmentally sensitive area (ESA) around the area within the Mojave River.

4.1.4.3. PROJECT IMPACTS

As stated above, this plant community was noted within the Mojave River. Because the proposed roadway is expected to be spanning the river on a bridge with no footings within the river, no direct impacts to this plant community are expected to

occur. There will be no shadowing effect to this community from the bridge and abutment structures (please see the discussion on shading effects in Section 4.9.7).

4.1.4.4. FREEWAY/EXPRESSWAY (FREEWAY/TOLLWAY)

4.1.4.4.1. Main Alignment/Common Areas

Approximately 9.63 acres of Freemont cottonwood forest occur within the main alignment/common areas. Through implementation of the above avoidance and minimization measures, impacts to this plant community will be avoided.

4.1.4.4.2. Main A/ Variation A

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.4.4.3. Main B/Variation B/Variation B1

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.4.4.4. Main D/Variation D

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.4.4.5. Main E/Variation E

Approximately 2.86 acres of Fremont cottonwood forest was observed within Main E, and approximately 0.72 acres occurs within Variation E. Through implementation of the above avoidance and minimization measures, impacts to this plant community would be avoided.

4.1.4.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

4.1.4.5.1. Main Alignment/Common Areas

Approximately 2.97 acres of black willow thickets occur within the main alignment/common areas. Approximately 9.63 acres of Freemont cottonwood forest occur within the main alignment/common areas. Through implementation of the above avoidance and minimization measures, impacts to this plant community would be avoided.

4.1.4.5.2. Main B/Variation B/Variation B1

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.4.5.3. Main D/Variation D

This plant community was not observed in this segment; therefore. no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.4.5.4. Main E/Variation E

Approximately 4.34 acres of Freemont cottonwood forest was observed within Main E, and approximately 2.78 acres occurs within Variation E. Through implementation of the above avoidance and minimization measures, impacts to this plant community would be avoided.

4.1.4.6. RAIL OPTION 1A, 1B, 1C, 7A, 7B, & 7C

This plant community was not observed in these segments; therefore, no impacts to this plant community would occur with the implementation of the proposed project for any of these segments.

4.1.4.7. COMPENSATORY MITIGATION

No impacts to this special-status plant community would occur. Therefore, no compensatory mitigation is required.

4.1.4.8. CUMULATIVE IMPACTS

No impacts to this special-status plant community would occur. Therefore, no cumulative impacts would occur.

4.1.5. Discussion of Red Willow Thickets

4.1.5.1. SURVEY RESULTS

Approximately 1.7 acres of red willow thickets are located within the BSA, mainly occurring near the Mojave River.

4.1.5.2. AVOIDANCE AND MINIMIZATION EFFORTS

As stated above, this plant community was identified within the Mojave River. As such, there is potential for impacts to this area to be limited with the design of a span bridge over the river with no footings within the river. A biological monitor will be

onsite to establish an environmentally sensitive area (ESA) around the area within the Mojave River.

4.1.5.3. PROJECT IMPACTS

As stated above, this plant community was noted within the Mojave River. Because the proposed roadway is expected to be spanning the river on a bridge with no footings within the river, no direct impacts to this plant community are expected to occur. There will be no shadowing effect to this community from the bridge and abutment structures (please see the discussion on shading effects in Section 4.9.7).

4.1.5.4. FREEWAY/EXPRESSWAY (FREEWAY/TOLLWAY)

4.1.5.4.1. Main Alignment/Common Areas

This plant community was not observed within the main alignment/common areas; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.5.4.2. Main A/ Variation A

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.5.4.3. Main B/Variation B/Variation B1

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.5.4.4. Main D/Variation D

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.5.4.5. Main E/Variation E

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.5.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

4.1.5.5.1. Main Alignment/Common Areas

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.5.5.2. Main B/Variation B/Variation B1

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.5.5.3. Main D/Variation D

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.5.5.4. Main E/Variation E

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.5.6. RAIL OPTION 1A, 1B, 1C, 7A, 7B, & 7C

This plant community was not observed in these segments; therefore, no impacts to this plant community would occur with the implementation of the proposed project for any of these segments.

4.1.5.7. COMPENSATORY MITIGATION

No impacts to this special-status plant community would occur. Therefore, no compensatory mitigation is required.

4.1.5.8. CUMULATIVE IMPACTS

No impacts to this special-status plant community would occur. Therefore, no cumulative impacts would occur.

4.1.6. Discussion of Sandbar Willow Thickets

4.1.6.1. SURVEY RESULTS

Approximately 3.8 acres of sandbar willow thickets are located within the BSA, mainly occurring near the Mojave River.

4.1.6.2. AVOIDANCE AND MINIMIZATION EFFORTS

As stated above, this plant community was identified within the Mojave River. As such, there is potential for impacts to this area to be limited with the design of a span bridge over the river with no footings within the river. A biological monitor will be onsite to establish an environmentally sensitive area (ESA) around the area within the Mojave River.

4.1.6.3. PROJECT IMPACTS

As stated above, this plant community was noted within the Mojave River. Because the proposed roadway is expected to be spanning the river on a bridge with no footings within the river, no direct impacts to this plant community are expected to occur. There will be no shadowing effect to this community from the bridge and abutment structures (please see the discussion on shading effects in Section 4.9.7).

4.1.6.4. FREEWAY/EXPRESSWAY (FREEWAY/TOLLWAY)

4.1.6.4.1. Main Alignment/Common Areas

This plant community was not observed within the main alignment/common areas; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.6.4.2. Main A/ Variation A

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.6.4.3. Main B/Variation B/Variation B1

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.6.4.4. Main D/Variation D

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.6.4.5. Main E/Variation E

Approximately 1.49 acres of sandbar willow thickets was observed within Variation E while none was observed within Main E. Through implementation of the above

avoidance and minimization measures, impacts to this plant community would be avoided.

4.1.6.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

4.1.6.5.1. Main Alignment/Common Areas

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.6.5.2. Main B/Variation B/Variation B1

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.6.5.3. Main D/Variation D

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.6.5.4. Main E/Variation E

Approximately 0.04 acres of sandbar willow thickets was observed within Main E, and approximately 1.38 acres occurs within Variation E. Through implementation of the above avoidance and minimization measures, impacts to these plant communities will be reduced.

4.1.6.6. RAIL OPTION 1A, 1B, 1C, 7A, 7B, & 7C

This plant community was not observed in these segments; therefore, no impacts to this plant community would occur with the implementation of the proposed project for any of these segments.

4.1.6.7. COMPENSATORY MITIGATION

No impacts to special-status plant communities would occur. Therefore, no compensatory mitigation is required.

4.1.6.8. CUMULATIVE IMPACTS

No impacts to special-status plant communities would occur. Therefore, no cumulative impacts would occur.

4.1.7. Discussion of Scale Broom Scrub [AA3]

4.1.7.1. SURVEY RESULTS

Approximately 24.99 acres of scale broom scrub are located within the BSA.

4.1.7.2. AVOIDANCE AND MINIMIZATION EFFORTS

As stated above, this plant community was identified at the boundaries of the BSA, and therefore there is potential for this area to be preserved in place, since not all of the BSA will be impacted. A biological monitor will be onsite to establish an environmentally sensitive area (ESA) around these areas where this species occurs. If impacts cannot be avoided, these areas should be included in the calculations for acquisition of land to preserve in perpetuity.

4.1.7.3. PROJECT IMPACTS

It is assumed at this time that all of this community will be permanently impacted, however it is also noted that some of this community occurs at the outer limits of the proposed project and therefore there is potential for preservation in place.

4.1.7.4. FREEWAY/EXPRESSWAY (FREEWAY/TOLLWAY)

4.1.6.4.1. Main Alignment/Common Areas

Approximately 15.05 acres of this plant community was observed within the main alignment/common areas. Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this plant community will be reduced.

4.1.6.4.2. Main A/ Variation A

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.6.4.3. Main B/Variation B/Variation B1

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.6.4.4. Main D/Variation D

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.6.4.5. Main E/Variation E

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.7.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

4.1.6.5.1. Main Alignment/Common Areas

Approximately 24.24 acres of this plant community was observed within the main alignment/common areas. Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this plant community will be reduced.

4.1.6.5.2. Main B/Variation B/Variation B1

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.6.5.3. Main D/Variation D

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.6.5.4. Main E/Variation E

This plant community was not observed in this segment; therefore, no impacts to this plant community would occur with the implementation of the proposed project for this segment.

4.1.7.6. RAIL OPTION 1A, 1B, 1C, 7A, 7B, & 7C

This plant community was not observed in these segments; therefore, no impacts to this plant community would occur with the implementation of the proposed project for any of these segments.

4.1.7.7. COMPENSATORY MITIGATION

Because this plant community is considered special-status by California Department of Fish & Wildlife, any area to be permanently impacted will be compensated by purchasing land at a 2:1 ratio within the region and preserved in perpetuity.

4.1.7.8. CUMULATIVE IMPACTS

Although there will be impacts to this plant community, implementation of the above-mentioned avoidance and minimization measures and compensatory mitigation will further reduce these impacts. Therefore, no contribution to the cumulative loss of this plant community is expected.

4.2. Special-Status Plant Species

A total of twenty-one (21) special status plant species were identified in Table 4 as being potentially present within the quadrangles the BSA spans over, based on preliminary literature research, and historical documentation including CNDDB occurrences. Of these species, five (5) were found present within the BSA based on focused surveys, which are as follows: alkali mariposa-lily, Booth's evening primrose, crowned muilla, Mojave fish-hook cactus, and white pygmy poppy. Discussions of all species are found below.

For the purpose of avoiding redundancy, when discussing project impacts to plant species, it should be known that the Freeway/Expressway Alternative, Freeway/Tollway Alternative, Freeway/Expressway Alternative with the HSR Feeder Service, and the Freeway/Tollway Alternative with the HSR Feeder Service are discussed collectively since the impacts amount to the same in main alignment/common areas. However, it is the variations and options that differ in impacts to plant species, and thus they are each broken down and discussed.

4.2.1. Alkali Mariposa-lily (*Calochortus striatus*): Federal Status-none; State Status-none; CNPS Rare Plant Rank-1B.2

4.2.1.1. SURVEY RESULTS

Twelve (12) individuals were identified in five locations west of the Mojave River at the boundaries of the BSA.

4.2.1.2. AVOIDANCE AND MINIMIZATION EFFORTS

The alkali mariposa-lily individuals are located within the temporary impact area, which will be disturbed during Project construction. Bulbs, and seed if available, of this species will be salvaged and propagated at an approved nursery until they can be planted within temporarily impacted areas after construction is complete. Mitigation areas chosen for transplanting bulbs, and dispersing salvaged seed, would be selected to minimize or avoid potential indirect effects. For example, mitigation areas would not be located in proximity to maintenance areas where grading could result in the loss of topsoil or soil compaction. Alkali mariposa-lily bulbs would be transplanted to mitigation areas within similar habitat and at a minimum the same

size as the affected areas, or if feasible returned to the location that they were originally salvaged.

Impacts to habitat where alkali mariposa-lily was found growing will be reduced by restoring the same habitat, in-kind, within temporarily impacted areas following construction. Prior to construction a species list will be compiled for habitat where alkali mariposa-lily has been detected during surveys. This species list will be used to create a plant palette and seed mix to be used during restoration. A Habitat Mitigation and Monitoring Plan (HMMP) will be prepared that includes 10 years of maintenance, monitoring, and reporting for alkali mariposa-lily and its habitat. The HMMP will also include specific details on the transplantation of alkali mariposa-lily bulbs and dispersal of seed.

4.2.1.3. PROJECT IMPACTS

An estimated 12 alkali mariposa-lily plants are anticipated to be affected by construction of this proposed project.

4.2.1.3.1. Freeway/Expressway (Freeway/Tollway)

4.2.1.3.1.1. Main Alignment/Common Areas

This plant was not observed in this segment; therefore, no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.1.3.1.2. Main A/Variation A

This plant was not observed in this segment; therefore, no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.1.3.1.3. Main B/Variation B/Variation B1

This plant was not observed in this segment; therefore, no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.1.3.1.4. Main D/Variation D

This plant was not observed in this segment; therefore, no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.1.3.1.5. Main E/Variation E

This plant was not observed within Main E. No individuals were observed within Variation E; therefore, Variation E would result in lesser impacts to this species in comparison to Main E.

Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this species will be reduced.

4.2.1.3.2. Freeway Expressway (freeway/Tollway) with HSR Alternative

4.2.1.3.2.1. Main Alignment/Common Areas

This plant was not observed in this segment; therefore, no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.1.3.2.2. Main B/Variation B/Variation B1

This plant was not observed in this segment; therefore, no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.1.3.2.3. Main D/Variation D

This plant was not observed in this segment; therefore, no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.1.3.2.4. Main E/Variation E

Twelve (12) individuals were observed within Main E. No individuals were observed within Variation E; therefore, Variation E would result in lesser impacts to this species in comparison to Main E.

Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this species will be reduced.

4.2.1.3.2.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

This plant was not observed in this segment; therefore, no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.1.4. COMPENSATORY MITIGATION

Impacts to alkali mariposa-lily and its habitat will be reduced by transplantation of individual plants (bulbs), dispersal of salvaged seed, and restoration of habitat in-kind for a period of 10 years with maintenance, monitoring, and reporting, therefore no compensatory mitigation will be required.

4.2.1.5. CUMULATIVE EFFECTS

Impacts to alkali mariposa-lily and its habitat will be reduced by transplantation of individual plants (bulbs), dispersal of salvaged seed, and restoration of habitat in-kind for a period of 10 years with maintenance, monitoring, and reporting, therefore no compensatory mitigation will be required.

4.2.2. Booth's Evening Primrose (*Eremothera boothii* ssp. *boothii* or *Camissonia boothii* ssp. *boothii*): Federal Status-none; State Status-none; CNPS Rare Plant Rank2B.3

4.2.2.1. SURVEY RESULTS

Two populations of Booth's evening primrose were observed. One population exists at a location along the Mojave River within the Variation E Alignment, within the unincorporated community of Mojave Heights. The Mojave river population has an estimated total of one (1) individual plant. Another population of an estimated 960 plants exists to the northwest and southwest of the intersection of Rancho Road/El Envado Road, within the unincorporated community of Mojave Heights. There is a chance that this population of approximately 960 plants is *Eremothera boothii* ssp. *intermedia* (also CNPS Rare Plant Rank 2B.3) however it has not been verified by the UCR Herbarium yet, therefore, it is assumed to *be E. boothii* ssp. *boothii* on account of the majority of physical characteristics fitting the key provided in the Jepson Manual, Vascular Plants of California, 2nd Edition.

4.2.2.2. AVOIDANCE AND MINIMIZATION EFFORTS

Impacts to the Booth's evening primrose growing within the Mojave river channel are not expected since the area will be avoided by spanning the river with a bridge. The population with an estimated count of 960 Booth's evening primrose individuals is located within both a permanent and temporary impact area, which will be disturbed during Project construction. If no seed is available at the time of plant salvage, several plants will be carefully salvaged and delivered to an approved nursery so that the plant can be maintained if it still has the potential to produce seed. The plant and/or seed will be kept until they can be planted within temporarily impacted areas after construction is completed.

If at the time of plant salvage, the Booth's evening primrose has already dropped all of its seed, then collection of seed from nearby populations of this plant will occur, upon authorization from the appropriate agency, landowner, etc. If nearby populations have already dropped their seed then soil salvage immediately surrounding each plant will occur do a depth of approximately three inches and a diameter of three feet around the base of the plant.

Mitigation areas chosen for dispersing salvaged seed would be selected to minimize or avoid potential indirect effects. For example, mitigation areas would not be located in proximity to maintenance areas where grading could result in the loss of topsoil or soil compaction. Booth's evening primrose seed (or soil potentially containing seed) would be dispersed to mitigation areas within similar habitat and at a minimum the

same size as the affected areas, or if feasible returned to the location that they were originally salvaged.

If impacts to habitat where Booth's evening primrose was found growing occurs, those impacts will be reduced by restoring the same habitat, in-kind, within temporarily impacted areas following construction. Prior to construction a species list will be compiled for habitat where Booth's evening primrose has been detected during surveys. This species list will be used to create a plant palette and seed mix to be used during restoration. A Habitat Mitigation and Monitoring Plan (HMMP) will be prepared that includes 10 years of maintenance, monitoring, and reporting for Booth's evening primrose lily and its habitat. The HMMP will also include specific details on the dispersal of Booth's evening primrose seed.

4.2.2.3. PROJECT IMPACTS

Although impacts to Booth's evening primrose are not anticipated for the population of Booth's evening primrose that exists within the Mojave river channel, impacts to up to 915 Booth's evening primrose is anticipated for the population that exists near the intersection of Rancho Road/El Envado Road.

4.2.2.3.1. Freeway Expressway (Freeway/Tollway) Alternative

4.2.2.3.1.1. Main Alignment/Common Areas

This plant was not observed in this segment; therefore no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.2.3.1.2. Main A/Variation A

This plant was not observed in this segment; therefore no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.2.3.1.3. Main B/Variation B/Variation B1

This plant was not observed in this segment; therefore no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.2.3.1.4. Main D/Variation D

This plant was not observed in this segment; therefore no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.2.3.1.5. Main E/Variation E

An estimated 581 individuals were observed within Variation E. Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this species will be reduced.

No individuals were observed within Main E. Therefore, Main E would result in lesser impacts to this species in comparison to Variation E.

4.2.2.3.2. Freeway Expressway (Freeway/Tollway) with HSR Alternative

4.2.2.3.2.1. Main Alignment/Common Areas

This plant was not observed in this segment; therefore no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.2.3.2.2. Main B/Variation B/Variation B1

This plant was not observed in this segment; therefore no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.2.3.2.3. Main D/Variation D

This plant was not observed in this segment; therefore no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.2.3.2.4. Main E/Variation E

An estimated 915 individuals were observed within Variation E. Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this species will be reduced.

4.2.2.3.2.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

This plant was not observed in this segment; therefore no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.2.4. COMPENSATORY MITIGATION

Impacts to Booth's evening primrose and its habitat will be reduced by dispersal of salvaged seed and, if necessary, restoration of habitat in-kind for a period of 10 years with maintenance, monitoring, and reporting, therefore no compensatory mitigation will be required.

4.2.2.5. CUMULATIVE EFFECTS

Although there will be temporary impacts to this plant species, there will be reduced impacts with the implementation of the above-mentioned avoidance and minimization measures. Therefore there will be no contribution to the cumulative effects of this species.

4.2.3. Crowned muilla (*Muilla coronata*): Federal Status-none; State Status-WL; CNPS Rare Plant Rank-4.2

4.2.3.1. SURVEY RESULTS

Seven (7) individuals of crowned muilla were identified in two populations within the boundaries of the BSA, and within unincorporated Los Angeles County north of the City of Palmdale.

4.2.3.2. AVOIDANCE AND MINIMIZATION EFFORTS

Crowned muilla individuals are located within the temporary impact area, which will disturbed during Project construction. Bulbs, and seed if available, of this species will be salvaged and propagated at an approved nursery until they can be planted within temporarily impacted areas after construction is complete. Mitigation areas chosen for transplanting bulbs, and dispersing salvaged seed, would be selected to minimize or avoid potential indirect effects. For example, mitigation areas would not be located in proximity to maintenance areas where grading could result in the loss of topsoil or soil compaction. Crowned muilla bulbs would be transplanted to mitigation areas within similar habitat and at a minimum the same size as the affected areas, or if feasible returned to the location that they were originally salvaged.

Impacts to habitat where crowned muilla was found growing will be reduced by restoring the same habitat, in-kind, within temporarily impacted areas following construction. Prior to construction a species list will be compiled for habitat where crowned muilla has been detected during surveys. This species list will be used to create a plant palette and seed mix to be used during restoration. A Habitat Mitigation and Monitoring Plan (HMMP) will be prepared that includes 10 years of maintenance, monitoring, and reporting for crowned muilla and its habitat. The HMMP will also include specific details on the transplantation of crowned muilla bulbs and dispersal of seed.

4.2.3.3. PROJECT IMPACTS

Up to five (5) individuals within two populations of crowned muilla plants are anticipated to be affected by construction of this Project.

4.2.3.3.1. Freeway Expressway (Freeway/Tollway) Alternative

4.2.3.3.1.1. Main Alignment/Common Areas

As stated above impacts to this plant species and its habitat will be reduced by translocation of individual plants and creation of like habitat, therefore no compensatory mitigation will be required.

4.2.3.3.1.2. Main A/Variation A

A total of three (3) individuals were observed within Main A. Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this species will be reduced.

No individuals were observed within Variation A. Therefore, Variation A will result in lesser impacts to this species in comparison to Main A.

4.2.3.3.1.3. Main B/Variation B/Var*i*ation B1

This plant was not observed in this segment; therefore no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.3.3.1.4. Main D/Variation D

This plant was not observed in this segment; therefore no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.3.3.1.5. Main E/Variation E

This plant was not observed in this segment; therefore no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.3.3.2. Freeway Expressway (Freeway/Tollway) with HSR Alternative

4.2.3.3.2.1. Main Alignment/Common Areas

Five (5) individuals were observed in this segment. Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this species will be reduced.

4.2.3.3.2.2. Main B/Variation B/Variation B1

This plant was not observed in this segment; therefore no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.3.3.2.3. Main D/Variation D

This plant was not observed in this segment; therefore no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.3.3.2.4. Main E/Variation E

This plant was not observed in this segment; therefore no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.3.3.2.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

This plant was not observed in this segment; therefore no impacts to this plant would occur with the implementation of the proposed project for this segment.

4.2.3.4. COMPENSATORY MITIGATION

Impacts to crowned muilla and its habitat will be reduced by transplantation of individual plants (bulbs), dispersal of salvaged seed, and restoration of habitat in-kind for a period of 10 years with maintenance, monitoring, and reporting, therefore no compensatory mitigation will be required.

4.2.3.5. CUMULATIVE EFFECTS

Although there will be temporary impacts to this plant species, implementation of the above-mentioned avoidance and minimization measures will further reduce these impacts. Therefore, there will be no contribution to the cumulative effects of this species.

4.2.4. Mojave fish-hook cactus (*Sclerocactus polyancistrus*): Federal Status-none; State Status-none; CNPS Rare Plant Rank-4.2

4.2.4.1. SURVEY RESULTS

Nine (9) individuals of Mojave fish-hook cactus were identified within the BSA in three general locations in zone east of the Mojave River, along the Main Alignment/Common Areas after the convergence of Main E/Variation E.

4.2.4.2. AVOIDANCE AND MINIMIZATION EFFORTS

Mojave fish-hook cactus individuals are located within the temporary impact area, which will disturbed during Project construction. Individuals will be salvaged and maintained at an approved nursery until they can be planted within temporarily impacted areas after construction is complete. Mitigation areas chosen for transplanting salvaged cactuses would be selected to minimize or avoid potential indirect effects. For example, mitigation areas would not be located in proximity to maintenance areas where grading could result in the loss of topsoil or soil compaction. Mojave fish-hook cactuses would be transplanted to mitigation areas within similar habitat and at a minimum the same size as the affected areas, or if feasible returned to the location that they were originally salvaged.

Impacts to habitat where Mojave fish-hook cactus was found growing will be reduced by restoring the same habitat, in-kind, within temporarily impacted areas following construction. Prior to construction a species list will be compiled for habitat where Mojave fish-hook cactus has been detected during surveys. This species list will be

used to create a plant palette and seed mix to be used during restoration. A Habitat Mitigation and Monitoring Plan (HMMP) will be prepared that includes 10 years of maintenance, monitoring, and reporting for Mojave fish-hook cactus and its habitat. The HMMP will also include specific details on the transplantation of Mojave fish-hook cactus.

4.2.4.3. PROJECT IMPACTS

Up to nine individuals of Mojave fish-hook cactus are anticipated to be affected by construction of this Project.

4.2.4.3.1. Freeway Expressway (Freeway/Tollway) Alternative

4.2.4.3.1.1. Main Alignment/Common Areas

This plant wasnot observed within the main alignment/common areas; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.4.3.1.2. Main A/Variation A

This plant was not observed in this segment; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.4.3.1.3. Main B/Variation B/Variation B1

This plant was not observed in this segment; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.4.3.1.4. Main D/Variation D

This plant was not observed in this segment; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.4.3.1.5. Main E/Variation E

One (1) individual was observed within Maine E and one (1) individual within Variation E. Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this species will be reduced.

4.2.4.3.2. Freeway Expressway (Freeway/Tollway) with HSR Alternative22

4.2.4.3.2.1. Main Alignment/Common Areas

This plant was not observed within the main alignment/common areas; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.4.3.2.2. Main B/Variation B/Variation B1

This plant was not observed in this segment; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.4.3.2.3. Main D/Variation D

This plant was not observed in this segment; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.4.3.2.4. Main E/Variation E

Five (5) individuals were observed within Main E and four (4) individuals within Variation E. Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this species will be reduced.

4.2.4.3.2.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

This plant was not observed in this segment; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.4.4. COMPENSATORY MITIGATION

Impacts to Mojave fish-hook cactus and its habitat will be reduced by transplantation of individual plants and restoration of habitat in-kind for a period of 10 years with maintenance, monitoring, and reporting, therefore no compensatory mitigation will be required.

4.2.4.5. CUMULATIVE EFFECTS

Although there will be temporary impacts to this plant species, there will be reduced impacts with the implementation of the above-mentioned avoidance and minimization measures. Therefore there will be no contribution to the cumulative effects of this species.

4.2.5. White pygmy-poppy (*Canbya candida*): Federal Status-none; State Status-WL; CNPS Rare Plant Rank-4.2

4.2.5.1. Survey Results

One population with and estimated 290 individuals were observed near Main A/Variation A within the boundaries of the BSA.

4.2.5.2. Avoidance and Minimization Efforts

White pygmy-poppy individuals are located within the temporary impact area, which will be disturbed during Project construction. Seed of this species will be salvaged and stored at an approved nursery until they can be planted within temporarily impacted areas after construction is complete. If a meager amount of seed is available at the time of salvage, a portion of the seed will be used to propagate white pygmy-poppy for seed bulking purposes.

Mitigation areas chosen for transplanting bulbs, and dispersing salvaged seed, would be selected to minimize or avoid potential indirect effects. For example, mitigation areas would not be located in proximity to maintenance areas where grading could result in the loss of topsoil or soil compaction. White pygmy-poppy seed would be dispersed to mitigation areas within similar habitat and at a minimum the same size as the affected areas, or if feasible dispersed the location that they were originally salvaged.

Impacts to habitat where white pygmy-poppy was found growing will be reduced by restoring the same habitat, in-kind, within temporarily impacted areas following construction. Prior to construction a species list will be compiled for habitat where white pygmy-poppy has been detected during surveys. This species list will be used to create a plant palette and seed mix to be used during restoration. A Habitat Mitigation and Monitoring Plan (HMMP) will be prepared that includes 10 years of maintenance, monitoring, and reporting for white pygmy-poppy and its habitat. The HMMP will also include specific details on the dispersal of white pygmy-poppy seed.

4.2.5.3. Project Impacts

An estimated 122 individuals within one population of pygmy white-poppy plants are anticipated to be affected by construction of this Project.

4.2.5.3.1. Freeway Expressway (Freeway/Tollway) Alternative

4.2.5.3.1.1. Main Alignment/Common Areas

This plant was not observed in this segment; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.5.3.1.2. Main A/Variation A

Approximately 122 individuals were observed within Main A. Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this species will be reduced.

No individuals were observed within Variation A. Therefore, Variation A will result in lesser impacts to this species in comparison to Main A.

4.2.5.3.1.3. Main B/Variation B/Variation B1

This plant was not observed in this segment; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.5.3.1.4. Main D/Variation D

This plant was not observed in this segment; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.5.3.1.5. Main E/Variation E

This plant was not observed in this segment; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.5.3.2. Freeway Expressway (Freeway/Tollway) with HSR Alternative

4.2.5.3.2.1. Main Alignment/Common Areas

This plant was not observed in this segment; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.5.3.2.2. Main A

Approximately 122 individuals were observed within Main A. Through implementation of the above avoidance and minimization measures, and replanting efforts, impacts to this species will be reduced.

4.2.5.3.2.3. Main B/Variation B/Variation B1

This plant was not observed in this segment; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.5.3.2.4. Main D/Variation D

This plant was not observed in this segment; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.5.3.2.5. Main E/Variation E

This plant was not observed in this segment; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.5.3.2.6. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

This plant was not observed in this segment; therefore no impacts to this plant species would occur with the implementation of the proposed project for this segment.

4.2.5.4. COMPENSATORY MITIGATION

Impacts to white pygmy-poppy and its habitat will be reduced by dispersal of salvaged seed and restoration of habitat in-kind for a period of 10 years with maintenance, monitoring, and reporting, therefore no compensatory mitigation will be required.

4.2.5.5. CUMULATIVE EFFECTS

Although there will be temporary impacts to this plant species, implementation of the above-mentioned avoidance and minimization measures will further reduce these impacts. Therefore, there will be no contribution to the cumulative effects of this species.

4.2.6. Discussion of Special-Status Plants

4.2.6.1. SURVEY RESULTS

No other special-status plant species were observed during surveys, with the exception of the five noted above. It should be noted that these focused surveys were conducted during an extended period of drought conditions. Although survey results indicated no presence during extreme drought conditions, it does not

preclude species in Table 3 that were not detected during surveys from occurring within the BSA.

4.2.6.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because there is potential for these plants to occur within the BSA, focused plant surveys will be conducted at a time prior to construction when detection is most optimal, such as normal rainfall years.

If the results of surveys indicate presence of any of these species, then seeds, bulbs, plants, etc. will be collected and propagated by an approved nursery followed by planting at on-site restoration areas within the project limits. Impacts to habitat where these species were found growing will be reduced by restoring the same habitat, in-kind, within temporarily impacted areas following construction. Prior to construction a species list will be compiled for habitat where these species were detected during surveys. This species list will be used to create a plant palette and seed mix to be used during restoration. A Habitat Mitigation and Monitoring Plan (HMMP) will be prepared that includes 10 years of maintenance, monitoring, and reporting for those species and their habitat. The HMMP will also include specific details on how to reintroduce those species to locations where they were originally salvaged from. Individual plants will be translocated out of impact zone.

4.2.6.3. PROJECT IMPACTS

As stated above, surveys will be conducted and if found, individual plants will be translocated and seeds will be propagated and planted. With this effort impacts to special status species will be reduced. At this point impacts to species that have not been observed within the BSA cannot be determined.

4.2.6.4. COMPENSATORY MITIGATION

As stated above impacts to these plant species will be reduced by translocation of individual plants, salvage and reintroduction to new locations, therefore no compensatory mitigation will be required.

Impacts to other special status species and their habitat, should it occur, will be reduced by dispersal of salvaged seed, transplantation, or dispersal of soil containing seed, and restoration of habitat in-kind for a period of 10 years with maintenance, monitoring, and reporting, therefore no compensatory mitigation will be required.

4.2.6.5. CUMULATIVE EFFECTS

Although there may be temporary impacts to these plant species, impacts will be reduced with the implementation of the above-mentioned avoidance and

minimization measures. Therefore, there will be no contribution to the cumulative effects of these species.

4.3. Common Wildlife

The shoulderband snail (*Helminthoglypta mohaveana*) is not considered special-status, but an impact analysis was conducted at the request of CDFW.

As stated in Section 3 above, the only potentially suitable habitat for this species would occur within nearby reaches of the Mojave River. Design and construction methods for the bridge crossing the river will avoid direct impacts to the river and its' habitat. Therefore, no direct impacts would occur to this species with the implementation of this proposed project. Also, with the implantation of mitigation measures and Best Management Practices intended to protect the Mojave River, indirect impacts to the River and this species are not expected. Because every alternative/option/variation crossing the river will have the same design and construction method, no impact to the river would occur with any of these variations.

4.4. Special-Status Wildlife

A total of forty-one (41) special status animal species were identified as occurring within the vicinity of the proposed project site. Of those, twenty-eight (28) species were observed or have a potential to occur within the project limits due to habitat suitability as noted in Table 2: Special-status Species with Potential for Occurrence. Discussion of these 28 species follows.

For the purpose of avoiding redundancy, when discussing project impacts, it should be known that the Freeway/Expressway Alternative, Freeway/Tollway Alternative, Freeway/Expressway Alternative with the HSR Feeder Service, and the Freeway/Tollway Alternative with the HSR Feeder Service are discussed collectively since the impacts amount to the same in main alignment/common areas. However, it is the variations and options that differ in impacts to animal species, and thus they are each broken down and discussed.

4.4.1. Silvery legless lizard (*Anniella pulchra pulchra*): Federal Status-none; State Status-SSC; USFS: S

4.4.1.1. Survey Results

Silvery legless lizard is known to occur in numerous locations within the vicinity of the BSA. Observations are within the same habitat type found within the project limits within one-half mile of the site.

4.4.1.2. AVOIDANCE AND MINIMIZATION EFFORTS

Impacts to this species can be minimized should they occur, to some extent, by requiring a biological monitor to be present on site during initial clearing and grubbing activity to capture and relocate any individuals. Because this species lives almost entirely underground, except possibly for short periods immediately following rain events, finding live and uninjured individuals during clearing activity is unlikely. If areas of high-density occurrences are found, salvage efforts can be made by careful removal of shrubs with clam-shell loaders and searching for individuals at the base of the shrub or within the root system as this is a more likely place for them to occur.

Habitat for this species can be re-established within temporary impact zones between the highway and edge of R.O.W. This area should be replanted with native plants similar to the natural surrounding area and the soil compacted only to a point necessary for construction purposes. This will allow any natural occurring individuals within the immediate vicinity to re-populate the temporary impact zone.

4.4.1.3. PROJECT IMPACTS

As noted above, this species is likely to occur throughout the BSA within natural shrub communities. Impacts to species based on the variations are discussed below. There is potential for occurrence in habitats in all alternatives, variations, and options. Because of the secretive nature of this species, its range is not completely understood, and it should be assumed this species occurs with equal potential throughout the entire BSA. Therefore the potential for impact becomes a comparison of plant communities and as natural communities occur within each option or variation.

4.4.1.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.1.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment common areas, impacts to silvery legless lizard have the potential to occur. Silvery legless lizard habitat occurs throughout the proposed project corridor, within natural scrub communities. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.1.4.2. Main A/Variation A

Potential impacts to the silvery legless lizard may occur with the implementation of this segment. The silvery legless lizard's preferred habitat type is known to occur within the limits of both Main A and Variation A. However, with the avoidance and minimization measures mentioned above, such as having a biological monitor present for clearing and grubbing activities and translocation of individuals on-site, impacts to this species are expected to be low. Main A would result in lesser acres of permanent and temporary impacts to scrubland habitat because it encompasses a smaller area in comparison to Variation A.

4.4.1.4.3. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the silvery legless lizard, and with the implementation of this segment impacts to the silvery legless lizard may occur. However, with the above mentioned avoidance and minimization measures, impacts to silvery legless lizard are expected to be low. Main B has the potential to have an impact on silvery legless lizard habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than those variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerable more acres of temporary and permanent impact to scrubland habitat in comparison to Variation B1, due to its alignment encompassing a greater area.

4.4.1.4.4. Main D/Variation D

Potential impacts to the silvery legless lizard may occur with the implementation of this segment. The silvery legless lizard's preferred habitat type is known to occur within the limits of both Main D and Variation D. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main D would result in lesser acres of permanent and temporary impacts to scrubland habitat because it encompasses a smaller area in comparison to Variation D.

4.4.1.4.5. Main E/Variation E

Potential impacts to the silvery legless lizard may occur with the implementation of this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are expected to be low. Main E would result in lesser acres of permanent and temporary impacts to scrubland habitat because it encompasses a smaller area in comparison to Variation E.

4.4.1.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative,

and therefore impacts to scrubland habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 4. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.1.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to silvery legless lizard have the potential to occur. Silvery legless lizard habitat occurs throughout the proposed project corridor, within natural scrub communities. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.1.5.2. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the silvery legless lizard, and with the implementation of this segment impacts to the silvery legless lizard may occur. However, with the above mentioned avoidance and minimization measures, impacts to silvery legless lizard are expected to be low. Main B has the potential to have an impact on silvery legless lizard habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than those variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to scrubland habitat in comparison to Variation B1, due to its alignment encompassing a greater area.

4.4.1.5.3. Main D/Variation D

Potential impacts to the silvery legless lizard may occur with the implementation of this segment. The silvery legless lizard's preferred habitat type is known to occur within the limits of both Main D and Variation D. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main D would result in lesser acres of permanent and temporary impacts to scrubland habitat because it encompasses a smaller area in comparison to Variation D.

4.4.1.5.4. Main E/Variation E

Potential impacts to the silvery legless lizard may occur with the implementation of this segment. With the avoidance and minimization measures mentioned in the

previous section, impacts to this species are expected to be low. Main E would result in lesser acres of permanent and temporary impacts to scrubland habitat because it encompasses a smaller area in comparison to Variation E.

4.4.1.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

All rail options include areas that have potential habitat for the silvery legless lizard, and with the implementation of either of these options, impacts to the silvery legless lizard may occur. However, with the above mentioned avoidance and minimization measures, impacts to silvery legless lizard are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.1.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for silvery legless lizard will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.1.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.2. Desert Tortoise (*Gopherus agassizii):* Federal Status- Threatened; State Status- Threatened

4.4.2.1. SURVEY RESULTS

The results of the focused surveys conducted in 2011, 2012, and 2013 determined the species to be present within the BSA. Suitable habitat within the BSA includes creosote bush scrub and desert saltbush scrub. Burrows, scat, and carcass material

were identified within the eastern most portion of the BSA as shown in the Appendix D. The species was physically identified in 2012 and 2013.

4.4.2.2. AVOIDANCE AND MINIMIZATION EFFORTS

Impacts to this species can be minimized, to some extent, by requiring a biological monitor to be present on site during initial clearing and grubbing activity to capture and relocate any individuals. Temporary desert tortoise fencing shall be installed on all portions of the project site accessible to desert tortoise. Focused surveys shall be conducted for desert tortoise and their burrows within the fenced area after the fence is installed and prior to ground-disturbing activities. Surveys will be conducted by an authorized biologist using USFWS protocols. Avoidance and minimization measure 5 (AMM-5) shall be implemented.

4.4.2.3. PROJECT IMPACTS

As noted above, this species is likely to occur within the BSA in natural shrub communities east of 240th Street East near the Los Angeles and San Bernardino County line. According to the Biological Opinion issued by the USFWS (April 2016), potentially occupied desert tortoise habitat only occurs east of 240th Street East, which the CDFW has concurred with. Direct and indirect impacts to desert tortoise have the potential to occur. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of mitigation measures BTE-14 through BTE-45 from the Biological Opinion, which were developed in consultation with CDFW to ensure consistency, the impacts to individuals of this species is expected to be low. Below is a discussion of direct and indirect impacts that could occur as a result of the implementation of the proposed project. The discussion is applicable to all Variations in each Alternative determined to have occupied habitat. Desert tortoise occupied habitat permanent impacts is based on the location of the permanent Right-of-Way fence around the Project, not necessarily on the vegetation communities. The corridor that will be within the fenced ROW will permanently restrict tortoises from entering. Despite an area being only temporarily impacted, if that area occurs within the fenced ROW, it was considered a permanent impact.

Direct Impacts

Depending on the Variations selected among each Alternative, a maximum of 1,686.89 acres of permanent impacts to occupied desert tortoise habitat has the potential to be impacted under the Highway and High Speed Rail compared to a maximum of 1,361.68 acres of permanent impacts to occupied desert tortoise habitat with the Highway only Alternative. Under the Preferred Alternative, a maximum of 1,686.89 acres would be permanently impacted. Under the Biological Opinion, it was

stated that 1,554.83 acres would be permanently impacted as a result of the Preferred Alternative, however because of slight engineering modification to reduce impacts elsewhere, the acreage was increased slightly.

Permanent habitat loss can also occur due to the presence of non-native and invasive plant species introduced into adjacent areas once the roadway has been constructed. Seeds can be introduced to desert tortoise habitat through tires of vehicles traveling on the roadway and trucks hauling plant material, such as grains or ornamental plants, that have the potential to germinate and grow in areas adjacent to the roadway. This is not expected to have a substantial effect to desert tortoise habitat outside of the Preferred Alternative because Caltrans regularly conducts shoulder maintenance activities in areas immediately adjacent to the roadway that will inhibit the growth of non-native and invasive plants introduced via vehicle travel.

Depending on the Variations selected among each Alternative, a maximum of 692.60 acres of temporary impacts to occupied desert tortoise habitat has the potential to be impacted under the Highway and High Speed Rail compared to a maximum of 789.09 acres of temporary impacts to occupied desert tortoise habitat with the Highway only Alternative.

The temporary impact areas include those areas located immediately adjacent to the Variation/Alternative that will be outside of the permanent desert tortoise fencing. These areas may be subject to use for vehicles and equipment staging areas, storage areas, access roads and other construction related activities. Once construction of the selected Variation/Alternative has been completed, appropriate native habitat will be replanted in temporarily affected areas according to the Habitat Mitigation Monitoring Plan (HMMP), which will be prepared in coordination with the appropriate regulatory agencies. Habitat for this species can be re-established within temporary impact zones between the highway and edge of the right-of-way. This area should be replanted with native plants similar to the natural surrounding area and the soil compacted only to a point necessary for construction purposes. This will allow any natural occurring individuals within the immediate vicinity to re-populate the temporary impact zone.

Mortality and/or injury of desert tortoises are not expected to occur during the construction phase of the project because of project measures implemented to exclude desert tortoises from the work areas (desert tortoise fencing and clearance surveys). Access and haul roads outside of the selected Variation/Alternative will be monitored and/or fenced on an as-needed basis and will contain appropriate signage and speed limits to reduce and/or eliminate impacts to desert tortoise outside of the selected Variation/Alternative. Furthermore, only approved access routes will be used for project access and equipment or material deliveries. Pets (including captive

tortoises) will not be allowed in the work areas during construction, so the possibility of introduction of disease, such as upper respiratory tract disease during the construction phase, will not be an impact to desert tortoise.

Mortality and/or injury of desert tortoises are also not anticipated once the new roadway is open and operational because the entire area within occupied desert tortoise habitat will be fenced with fencing to exclude desert tortoises and other wildlife species to prevent vehicle-wildlife collisions and illegal collection of desert tortoises by the public. Introduction of disease to desert tortoises located outside of the selected Variation/Alternative is also not expected to be an impact with the presence of the desert tortoise/wildlife fence that will be constructed around the roadway.

It is possible that power poles will be constructed in association with the High Speed Rail component of the project. Current plans have not determined whether the train will be operated on diesel fuel or whether it will be operated electrically. If the train will be operated electrically, power poles in association with the train will be constructed and may provide perching sites for potential desert tortoise predators, including as common ravens. Anti-perch structures will be placed on the power poles, so this is not anticipated to be an impact to desert tortoises.

Trash may be associated with the new roadway once it is open for public use. Trash can attract desert tortoise predators, including common ravens and coyotes. The desert tortoise/wildlife fence will likely preclude coyotes from being attracted to the trash items, but fence will not provide a barrier to common ravens. Caltrans maintenance crews regularly remove trash from roadsides and wildlife-proof trash receptacles will be used at all rest stops.

Indirect Impacts

Indirect impacts could occur to desert tortoise from noise and vibration from construction activities and increased human activity, visual disturbance, dust, habitat fragmentation, growth inducement, and recreation. These impacts will be minimized through implementation of avoidance, minimization, and/or mitigation measures.

Noise from activities associated with the construction of the selected Variation/Alternative has the potential to indirectly affect desert tortoise behavior. If desert tortoises are present adjacent to the construction zones, then they may be subject to impacts from construction noise and ground vibrations. The use of large pieces of equipment with running engines, compaction equipment, drilling etc. has the potential to impact the natural behavior of the desert tortoise. Construction noise may disrupt the communication and damage the auditory system in desert tortoises. Tortoises use up to eleven different classes of vocalizations used many different

social encounters (Patterson 1971, 1976). Human created noise such as that involved with construction may mask or cloud the tortoises' vocalizations and may hinder an individual's ability to communicate or respond appropriately. Construction noise could also mask the sounds of an approaching predator (USFWS1994). Past studies have found that lizards, when exposed to loud sounds even in short bursts, had damaged hearing and that repeated exposure was likely to result in even greater loss in auditory functions. While little research has been conducted on tortoises, it is likely that similar results would occur in desert tortoise (USFWS 1994). In addition, tortoises respond to ground vibrations, and construction related vibrations may encourage a desert tortoise to leave its burrow. In fact, it is fairly well known that slapping the pallet of a tortoise burrow several times will often cause the desert tortoise to emerge from its burrow to investigate the vibration. Furthermore, noise and ground disturbance has the potential to affect courtship/breeding activities of desert tortoises located in the areas adjacent to the selected Variation/Alternative.

Exceptionally noisy activities, such as blasting and pile driving, are expected to occur within the selected Variation/Alternative in desert tortoise habitat. Pile driving will not only be noisy but will create greater ground vibrations than operating construction equipment and vehicles within the selected Variation/Alternative. This impact is considered temporary, associated with the construction phase of the project only, and is not expected to be substantial to desert tortoise because tortoise densities are very low, and buffers will be established around pile driving activities that will dissipate the ground vibrations and noise by the time they reach potentially occupied desert tortoise habitat outside of the selected Variation/Alternative. Pile driving will occur where viaducts will be constructed and all work areas will be temporarily fenced during construction. The area that will be fenced is going to be at least 500 ft (152 m) wide, with the pile driving occurring in a 100-ft (30 m) span in the middle of the 500-foot temporary impact area, leaving a buffer of at least 200 ft (60 m) on either side of pile driving activities. Some viaducts have an even larger temporary impact area, thus creating an even larger buffer around pile driving activities. With this buffer zone, it is not anticipated that effects from pile driving will have much of an impact to desert tortoises in the areas adjacent to the selected Variation/Alternative.

Once the selected Variation/Alternative has been constructed, the noise from the highway traffic and ground vibrations of the vehicles traveling over the pavement will cause permanent noise impacts to desert tortoises within the surrounding area.

Increased human activity and visual disturbances will be create permanent impacts to desert tortoise habitat located immediately adjacent to the selected Variation/Alternative once the roadway has been constructed. However, these affects are not expected to be substantial to desert tortoises because tortoise

densities are low and they will only occur on the edges of desert tortoise habitat that abut the selected Variation/Alternative. The entire roadway will be fenced with desert tortoise fencing at a certain distance from the roadway to exclude desert tortoises from the area and this fencing will also create a buffer from the increased human activity and visual disturbances associated with the new roadway. Areas within the interior portions of desert tortoise habitat (further away from the roadway and associated desert tortoise fencing) will not be affected by this impact.

Temporary impacts from increased human activities and visual disturbance will occur during the construction phase of the project; however, these impacts are not expected to be different from the permanent impacts associated with the new roadway (discussed above).

Fugitive dust is a likely result of construction activities within the selected Variation/Alternative. This impact is considered a temporary impact because it will not occur once construction is completed. Because the selected Variation/Alternative is in a region that is subject to frequent windy conditions, the additional dust created by construction will likely be a minimal temporary impact. Additionally, dust control measures required by the Mojave Desert Air Quality Management District will minimize dust during construction.

Habitat fragmentation and road edge effects are expected to be a permanent impact associated with the project. The construction of the new roadway will further fragment habitat and create a new road effect zone that would affect desert tortoises in the area. The road effect zone is defined as a depressed population of desert tortoise adjacent to roadways existing up to 1,312 ft (400 m) from the edge of roadway (Boarman and Sazaki 2006). Not only does this impact reduce the amount of available habitat for desert tortoises in the area, it has the potential to decrease reproduction and gene flow through a regional tortoise population. Areas will remain connected through use of seven viaducts and 132 culverts designed for wildlife use. This is considered a permanent affect to desert tortoise.

With the construction of a new roadway within the selected Variation/Alternative, there is expected to be an increase in the number of travelers and accommodations along this route, and growth through the relocation and/or establishment of businesses along an area that is currently relatively undeveloped. The construction of these facilities may also permanently impact desert tortoise by reducing potential habitat.

With a high number of travelers expected on the new roadway, there is an increased potential for OHV activity. This may cause disturbance to desert tortoise habitat and potential direct impacts to desert tortoise.

Impacts to occupied desert tortoise habitat located within each Variation of each Alternative are described below.

4.4.2.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact. Table 11 c[MW4]ontains the amount of occupied habitat per species within each Variation of this Alternative for which the acreages stated below are derived from.

4.4.2.4.1. Main Alignment/Common Areas

Approximately 1,099.16 acres of occupied desert tortoise habitat exists within this segment. Approximately 738.28 acres would be permanently impacted. Approximately 360.88 acres would be temporarily impacted. Through implementation of avoidance and minimization measures, impacts would be reduced.

4.4.2.4.2. Main A/Variation A

According to the Biological Opinion issued by the USFWS (April 2016), potentially occupied desert tortoise habitat only occurs east of 240th Street East. Construction of this segment would not result in impacts to desert tortoise habitat.

4.4.2.4.3. Main B/Variation B/Variation B1

Approximately 472.40 acres of occupied desert tortoise habitat exists within Main B. Approximately 296.94 acres would be permanently impacted. Approximately 175.46 acres would be temporarily impacted. Through implementation of avoidance and minimization measures, impacts would be reduced.

Approximately 544.86 acres of occupied desert tortoise habitat exists within Variation B. Approximately 341.92 acres would be permanently impacted. Approximately 212.94 acres would be temporarily impacted. Through implementation of avoidance and minimization measures, impacts would be reduced.

Approximately 503.30 acres of occupied desert tortoise habitat exists within Variation B1. Approximately 319.09 acres would be permanently impacted. Approximately 184.22 acres would be temporarily impacted. Through implementation of avoidance and minimization measures, impacts would be reduced.

4.4.2.4.4. Main D/Variation D

According to the Biological Opinion issued by the USFWS (April 2016), potentially occupied desert tortoise habitat only occurs east of 240th Street East. Construction of this segment would not result in impacts to desert tortoise habitat.

4.4.2.4.5. Main E/Variation E

Approximately 357.36 acres of occupied desert tortoise habitat exists within Main E. Approximately 266.38 acres would be permanently impacted. Approximately 90.98 acres would be temporarily impacted. Through implementation of avoidance and minimization measures, impacts would be reduced.

Approximately 357.36 acres of occupied desert tortoise habitat exists within Variation E. Approximately 281.48 acres would be permanently impacted. Approximately 75.88 acres would be temporarily impacted. Through implementation of avoidance and minimization measures, impacts would be reduced

4.4.2.5. Freeway Expressway (Freeway/Tollway) with HSR Alternative

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 6. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species. Table 12 and 13 contains the amount of occupied habitat per species within each Variation of this Alternative for which the acreages stated below are derived from.

4.4.2.5.1. Main Alignment/Common Areas

Approximately 1,044.24 acres of occupied desert tortoise habitat exists within this segment. Approximately 754.71 acres would be permanently impacted. Approximately 289.53 acres would be temporarily impacted. Through implementation of avoidance and minimization measures, impacts would be reduced.

4.4.2.5.2. Main B/Variation B/Variation B1

Approximately 564.28 acres of occupied desert tortoise habitat exists within Main B. Approximately 469.37 acres would be permanently impacted. Approximately 94.91 acres would be temporarily impacted. Through implementation of avoidance and minimization measures, impacts would be reduced.

Approximately 636.16 acres of occupied desert tortoise habitat exists within Variation B. Approximately 530.89 acres would be permanently impacted. Approximately 105.27 acres would be temporarily impacted. Through implementation of avoidance and minimization measures, impacts would be reduced.

Approximately 606.95 acres of occupied desert tortoise habitat exists within Variation B1. Approximately 542.93 acres would be permanently impacted. Approximately 64.02 acres would be temporarily impacted. Through implementation of avoidance and minimization measures, impacts would be reduced.

4.4.2.5.3. Main D/Variation D

According to the Biological Opinion issued by the USFWS (April 2016), potentially occupied desert tortoise habitat only occurs east of 240th Street East. Construction of this segment would not result in impacts to desert tortoise habitat.

4.4.2.5.4. Main E/Variation E

Approximately 582.14 acres of occupied desert tortoise habitat exists within Main E. Approximately 356.51 acres would be permanently impacted. Approximately 225.63 acres would be temporarily impacted. Through implementation of avoidance and minimization measures, impacts would be reduced.

Approximately 586.62 acres of occupied desert tortoise habitat exists within Variation E. Approximately 365.43 acres would be permanently impacted. Approximately 221.19 acres would be temporarily impacted. Through implementation of avoidance and minimization measures, impacts would be reduced.

4.4.2.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

According to the Biological Opinion issued by the USFWS (April 2016), potentially occupied desert tortoise habitat only occurs east of 240th Street East. Construction of the Rail Options would not result in impacts to desert tortoise habitat.

4.4.2.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. As such, suitable habitat for desert tortoise will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.2.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region, impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.3. Coast horned lizard (*Phrynosoma blainvillii*): Federal Status-none; State Status-SSC BLM:Sensitive USFS: Sensitive

4.4.3.1. SURVEY RESULTS

Suitable habitat for this species is present and several individuals were observed within the limits of the project on site visits.

4.4.3.2. AVOIDANCE AND MINIMIZATION EFFORTS

The habitat for this species noted within the BSA appears similar to other areas within the region, therefore there is no evidence to suggest there would be a greater density of this species found within the BSA. It is expected that the number of individuals found will be equal to those of the surrounding area. As such, avoidance and minimization measures AMM-1, and AMM-5 shall be implemented for this species.

4.4.3.3. PROJECT IMPACTS

As noted above, this species occurs within the proposed BSA. Because of the nature and lifestyle of this species, it is expected that individuals will be taken during clearing and grubbing activities. Because the habitat on the project site appears similar to those of the surrounding area, it is expected that impacts to this species would be no greater than the number of individuals are expected to be taken in any one area within the BSA.

4.4.3.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.3.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to coast horned lizard have the potential to occur. Coast horned lizard habitat occurs throughout the

proposed project corridor, within annual grassland, coastal sage scrub, chaparral, and woodland communities. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.3.4.2. Main A/Variation A

Potential impacts to the coast horned lizard may occur with the implementation of this segment. The coast horned lizard's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main A would result in less acres of permanent and temporary impacts to annual grassland, coastal sage scrub, chaparral, and woodland habitats when compared to Variation A due to it encompassing a smaller area.

4.4.3.4.3. Main B/Variation B/Variation B1

Potential impacts to the coast horned lizard may occur with the implementation of this segment. The coast horned lizard's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main B has the potential to impact coast horned lizard habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to annual grassland, coastal sage scrub, chaparral, and woodland habitat in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.3.4.4. Main D/Variation D

Potential impacts to the coast horned lizard may occur with the implementation of this segment. The coast horned lizard's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would result in less acres of permanent and temporary impacts to annual grassland, coastal sage scrub, chaparral, and woodland habitat in comparison to Variation D, due to encompassing a smaller area.

4.4.3.4.5. Main E/Variation E

Potential impacts to the coast horned lizard may occur with the implementation of this segment. The coast horned lizard's preferred habitat type is known to occur within the limits of this segment. With the avoidance and minimization measures

mentioned in the previous section, impacts to this species are considered to be low. Main E requires fewer acres for implementation in comparison to Variation E and therefore it will have less of an impact to coast horned lizard habitat.

4.4.3.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.3.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to coast horned lizard have the potential to occur. Coast horned lizard habitat occurs throughout the proposed project corridor, within annual grassland, coastal sage scrub, chaparral, and woodland communities. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.3.5.2. Main B/Variation B/Variation B1

Potential impacts to the coast horned lizard may occur with the implementation of this segment. The coast horned lizard's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main B has the potential to impact coast horned lizard habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to annual grassland, coastal sage scrub, chaparral, and woodland habitat in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.3.5.3. Main D/Variation D

Potential impacts to the coast horned lizard may occur with the implementation of this segment. The coast horned lizard's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization

measures mentioned above, impacts to this species would be minor. Main D would result in less acres of permanent and temporary impacts to annual grassland, coastal sage scrub, chaparral, and woodland habitat in comparison to Variation D, due to encompassing a smaller area.

4.4.3.5.4. Main E/Variation E

Potential impacts to the coast horned lizard may occur with the implementation of this segment. The coast horned lizard's preferred habitat type is known to occur within the limits of this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are considered to be low. Main E requires fewer acres for implementation in comparison to Variation E and therefore it will have less of an impact to coast horned lizard habitat.

4.4.3.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

The rail options includes areas that are potential habitat to the coast horned lizard, and with the implementation of these options, impacts to the coast horned lizard may occur. However, with the above mentioned avoidance and minimization measures, impacts to coast horned lizard are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.3.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for coast horned lizard will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.3.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to

all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.4. Cooper's hawk (*Accipiter cooperii*): Federal Status-none State Status- Watch Listed

4.4.4.1. SURVEY RESULTS

Suitable habitat for this species is present and one individual was observed within the limits of the BSA on site visits.

4.4.4.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 2, 4, listed in Table 6, should be implemented.

4.4.4.3. PROJECT IMPACTS

Although individual adult birds are expected to flee in the presence of construction equipment, potential exists for impact to active nests and fledglings that are reliant upon them. Active nests are protected by the Migratory Bird Treaty Act and various sections of California Fish and Game Code. With the implementation of the above avoidance and minimization measures to protect active bird nests, this potential is eliminated or reduced to a level that is less than substantial.

4.4.4.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.4.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to Cooper’s hawk have the potential to occur. Cooper’s hawk foraging and nesting habitat occurs throughout the proposed project corridor, within woodland and semi-open habitats, riparian groves and mountain canyons. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.4.4.2. Main A/Variation A

Potential impacts to the Cooper's hawk may occur with the implementation of this segment. The Cooper's hawk preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main A would require fewer acres of permanent and temporary impacts to Cooper's hawk preferred foraging and nesting habitat of woodland and semi-open habitats when compared to Variation A.

4.4.4.4.3. Main B/Variation B/Variation B1

Potential impacts to the habitat for Cooper's hawk may occur with the implementation of this segment. However, with the above mentioned avoidance and minimization measures, impacts to Cooper's hawk are expected to be low. Main B has the potential to have impacts on Cooper's hawk habitat to a lesser extent than Variation B and Variation B1, as this option covers less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to the Cooper's hawk preferred foraging and nesting habitat of woodland and semi-open habitats in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.4.4.4. Main D/Variation D

Potential impacts to the Cooper's hawk may occur with the implementation of this segment. The Cooper's hawk preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat of woodland and semi-open habitats in comparison to Variation D, due to covering a smaller area.

4.4.4.4.5. Main E/Variation E

Potential impacts to the Cooper's hawk may occur with the implementation of this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to Cooper's hawk foraging and nesting habitat if implemented.

4.4.4.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative,

and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.4.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to Cooper's hawk have the potential to occur. Cooper's hawk foraging and nesting habitat occurs throughout the proposed project corridor, within woodland and semi-open habitats, riparian groves and mountain canyons. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.4.5.2. Main B/Variation B/Variation B1

Potential impacts to the habitat for Cooper's hawk may occur with the implementation of this segment. However, with the above mentioned avoidance and minimization measures, impacts to Cooper's hawk are expected to be low. Main B has the potential to have impacts on Cooper's hawk habitat to a lesser extent than Variation B and Variation B1, as this option covers less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to the Cooper's hawk preferred foraging and nesting habitat of woodland and semi-open habitats in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.4.5.3. Main D/Variation D

Potential impacts to the Cooper's hawk may occur with the implementation of this segment. The Cooper's hawk preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat of woodland and semi-open habitats in comparison to Variation D, due to covering a smaller area.

4.4.4.5.4. Main E/Variation E

Potential impacts to the Cooper's hawk may occur with the implementation of this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer

acres for implementation in comparison to Variation E, therefore it will have less of an impact to Cooper's hawk foraging and nesting habitat if implemented.

4.4.4.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the Cooper's hawk, and with the implementation of either option, impacts to the Cooper's hawk may occur. However, with the above mentioned avoidance and minimization measures, impacts to the Cooper's hawk are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.4.5.6. Main Alignment/Common Areas

Within the BSA of the Main alignment/common areas, impacts to Cooper's hawk have the potential to occur. Cooper's hawk foraging and nesting habitat occurs throughout the proposed project corridor, within woodland and semi-open habitats, riparian groves and mountain canyons. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.4.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for Cooper's hawk will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.4.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to

all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.5. Northern harrier (*Circus cyaneus*) Federal Status-none State Status- SSC

4.4.5.1. SURVEY RESULTS

Suitable habitat for this species is present and one individual was observed within the limits of the project on site visits.

4.4.5.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.5.3. PROJECT IMPACTS

Because of the relatively low amounts of suitable habitat for this species, its expected numbers within the BSA at any given time would be low, and therefore project impacts to this species is expected to be low.

4.4.5.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.5.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to northern harrier have the potential to occur. Northern harrier foraging and nesting habitat occurs throughout the proposed project corridor, within freshwater marshes and semi-open habitat. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.5.4.2. Main A/Variation A

Potential impacts to the northern harrier may occur with the implementation of this segment. Northern harrier preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be

low. Main A would require fewer acres of permanent and temporary impacts to northern harrier preferred foraging and nesting habitat of freshwater marshes and semi-open habitat when compared to Variation A.

4.4.5.4.3. Main B/Variation B/Variation B1

This segment includes areas that are potential foraging and nesting habitat to the northern harrier, and with the implementation of this variation impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to northern harrier are expected to be low. Main B has the potential to have impact on northern harrier habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to northern harrier preferred foraging and nesting habitat of freshwater marshes and semi-open habitat in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.5.4.4. Main D/Variation D

Potential impacts to the northern harrier may occur with the implementation of this segment. Northern harrier preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat of freshwater marshes and semi-open habitat in comparison to Variation D, due to traversing a shorter distance.

4.4.5.4.5. Main E/Variation E

Potential habitat for the northern harrier occurs within the potential impact area of this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to northern harrier foraging and nesting habitat if implemented.

4.4.5.5. Freeway Expressway (Freeway/Tollway) with HSR Alternative

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment

would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.5.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to northern harrier have the potential to occur. Northern harrier foraging and nesting habitat occurs throughout the proposed project corridor, within freshwater marshes and semi-open habitat. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.5.5.2. Main B/Variation B/Variation B1

This segment includes areas that are potential foraging and nesting habitat to the northern harrier, and with the implementation of this variation impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to northern harrier are expected to be low. Main B has the potential to have impact on northern harrier habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to northern harrier preferred foraging and nesting habitat of freshwater marshes and semi-open habitat in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.5.5.3. Main D/Variation D

Potential impacts to the northern harrier may occur with the implementation of this segment. Northern harrier preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat of freshwater marshes and semi-open habitat in comparison to Variation D, due to traversing a shorter distance.

4.4.5.5.4. Main E/Variation E

Potential habitat for the northern harrier occurs within the potential impact area of this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to northern harrier foraging and nesting habitat if implemented.

4.4.5.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the northern harrier, and with the implementation of these options, impacts to the northern harrier may occur. However, with the above mentioned avoidance and minimization measures, impacts to the northern harrier are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.5.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for northern harrier will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.5.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.6. Tricolored blackbird (*Agelaius tricolor*): Federal Status-none; State Status-SSC; BLM-Sensitive

4.4.6.1. SURVEY RESULTS

Suitable foraging habitat for this species is present within the BSA and this species was seen in a flock on several surveys. Nesting habitat occurs outside the BSA.

4.4.6.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.6.3. PROJECT IMPACTS

Impacts to nesting habitat are not expected since it is located outside the BSA. Because of the relatively low amounts of foraging habitat for this species within the BSA, its expected numbers within the BSA at any given time would be low, and therefore project impacts to this species is expected to be low.

4.4.6.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.6.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the tricolored blackbird have the potential to occur. Tricolored blackbird foraging and nesting habitat occurs throughout the proposed project corridor, within freshwater marshes and agricultural lands where livestock is present. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.6.4.2. Main A/Variation A

Potential impacts to the tricolored blackbird may occur with the implementation of this segment. Tricolored blackbird preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main A would require fewer acres of permanent and temporary impacts to tricolored blackbird preferred foraging and nesting habitat of freshwater marshes and agricultural lands containing livestock, when compared to the Variation A.

4.4.6.4.3. Main B/Variation B/Variation B1

Main B includes areas that are potential habitat to the tricolored blackbird, and with the implementation of this variation impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to

tricolored blackbird are expected to be low. Main B has the potential to have impacts on tricolored blackbird habitat to a greater extent than Variation B1, as this option traverses less space than these variations and at one location, bisects farmland which is suitable foraging habitat. Variation B requires considerably more acres of temporary and permanent impact to tricolored blackbird preferred foraging and nesting habitat of freshwater marshes and occupied agricultural land in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.6.4.4. Main D/Variation D

Potential impacts to the tricolored blackbird may occur with the implementation of this segment. Tricolored blackbird preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat of freshwater marshes and livestock occupied farmland in comparison to Variation D, due to traversing a shorter distance.

4.4.6.4.5. Main E/Variation E

Potential habitat for the tricolored blackbird occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to tricolored blackbird foraging and nesting habitat if implemented.

4.4.6.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.6.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the tricolored blackbird have the potential to occur. Tricolored blackbird foraging and nesting habitat occurs throughout the proposed project corridor, within freshwater marshes and agricultural lands where livestock is present. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the

implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.6.5.2. Main B/Variation B/Variation B1

Main B includes areas that are potential habitat to the tricolored blackbird, and with the implementation of this variation impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to tricolored blackbird are expected to be low. Main B has the potential to have impacts on tricolored blackbird habitat to a greater extent than Variation B1, as this option traverses less space than these variations and at one location, bisects farmland which is suitable foraging habitat. Variation B requires considerably more acres of temporary and permanent impact to tricolored blackbird preferred foraging and nesting habitat of freshwater marshes and occupied agricultural land in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.6.5.3. Main D/Variation D

Potential impacts to the tricolored blackbird may occur with the implementation of this segment. Tricolored blackbird preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat of freshwater marshes and livestock occupied farmland in comparison to Variation D, due to traversing a shorter distance.

4.4.6.5.4. Main E/Variation E

Potential habitat for the tricolored blackbird occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to tricolored blackbird foraging and nesting habitat if implemented.

4.4.6.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the tricolored blackbird, and with the implementation of these options, impacts to the tricolored blackbird may occur. However, with the above mentioned avoidance and minimization measures, impacts to the tricolored blackbird are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and

7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.6.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for northern harrier will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.6.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.7. Golden eagle (*Aquila chrysaetos*): Federal Status-Fully Protected; State Status: Fully Protected

4.4.7.1. SURVEY RESULTS

No individuals of this species were noted within the BSA during the 2015 focused survey; however, one individual was observed foraging in the vicinity of the proposed project near the Victorville dump facility. In addition, a record search and interviews with professional raptor experts was conducted and several nest sites have been noted north and east of the project envelop during studies unrelated to this proposed project. Suitable foraging habitat for this species was noted in various locations at the east end of the project site and nesting sites are known to occur further east.

4.4.7.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.7.3. PROJECT IMPACTS

Suitable foraging habitat was observed within the limits of this proposed project. As such, the implementation of the proposed project has the potential to impact this species during the construction phase and during the continued use of the facility after construction. Although no known nesting sites occur within the limits of the project, one potential impact may occur when individuals attempt to hunt in suitable habitat where a nest is known to occur on Bell Mountain. . Because adults of this species have the ability to fly away, direct impacts to individual adults are not expected during the construction phase of this project. Individuals hunting near the completed facility would have to avoid vehicles traveling at high speeds. Because vehicle/bird strikes are known to occur, there is potential for individual mortality. With the implementation of BTE-1, BTE-2, [MW5]and BAN-6 [this measure requires installation of fencing that would reduce the potential for roadkill that would attract eagles to the freeway], the potential for impacts would be reduced to the point where golden eagle mortality is not expected. In addition, the accidental taking of an eagle by collision with a motor vehicle while the vehicle is being operated on a highway is not a violation of the FGC.

Implementation of this proposed project would permanently convert suitable foraging habitat at the east end of the site to a paved highway/transit facility. The amount of suitable foraging habitat can be challenging to determine without a multi-year radio tracking study. Based on conversations with resource personnel and estimated home range and foraging ranges this species is expected to forage up to five miles from its' nesting site during breeding season. When known nest sites within a five-mile radius of the proposed project are mapped relative to the project boundary we find 2 nesting/foraging territories overlapping with the project limits. These areas can be viewed on the map set in the Consolidated Raptor Survey Report, Appendix L. The conversion of these areas will result in the permanent loss of Golden eagle foraging habitat. The amount of permanent habitat loss depends on which alternative and variation is selected. The maximum amount of permanent impacts to foraging golden eagle habitat is 696.19 acres and the maximum amount of temporary impacts is 461.95 acres. Because nest sites and suitable foraging habitat occurs only at the east end of the project site, only differences among Freeway Expressway, Freeway Expressway with HSR, and Variation E in the Victorville and Apple Valley area are further discussed below.

4.4.7.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts

to habitat for this species will occur to a lesser extent of approximately 150 acres because of the reduced area of impact.

Impacts to golden eagle foraging habitat located within five miles of known nest sites are described below. Table 11 contains the amount of occupied habitat per species within each Variation of this Alternative for which the acreages stated below are derived from.

4.4.7.4.1. Main Alignment/Common Areas

Approximately 768.47 acres of foraging habitat exists within five miles of a known golden eagle nest within this segment. Approximately 448.81 acres would be permanently impacted. Approximately 319.66 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.7.4.2. Main E

Approximately 169.55 acres of foraging habitat exists within five miles of a known golden eagle nest within this segment. Approximately 135.66 acres would be permanently impacted and approximately 33.89 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.7.4.3. Variation E

Approximately 159.35 acres of foraging habitat exists within five miles of a known golden eagle nest within this segment. Approximately 76.07 acres would be permanently impacted and approximately 83.28 acres would be temporarily impacted. Through implementation of avoidance and minimization measures, impacts would be reduced.

4.4.7.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint and greater area within the vicinity of the Bell Mountain nest site when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be approximately 111 acres higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition, the HSR spur in Victorville that departs from the highway alignment would account for this additional impact for this alternative, affecting approximately 150 acres of scrubland habitat. Table 12 and 13 contains the amount

of occupied habitat per species within each Variation of this Alternative for which the acreages stated below are derived from.

4.4.7.5.2. Main Alignment/Common Areas

Approximately 765.88 acres of foraging habitat exists within five miles of a known golden eagle nest within this segment. Approximately 459.74 acres would be permanently impacted and approximately 306.14 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.7.5.3. Main E

Approximately 328.99 acres of foraging habitat exists within five miles of a known golden eagle nest within this segment. Approximately 173.18 acres would be permanently impacted and approximately 155.81 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.7.5.4. Variation E

Approximately 351.38 acres of foraging habitat exists within five miles of a known golden eagle nest within this segment. Approximately 236.45 acres would be permanently impacted and approximately 114.93 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.7.6. COMPENSATORY MITIGATION

As stated above, depending on the alternative and variations that are chosen up to approximately 696 acres of suitable foraging habitat for Golden eagle could be permanently converted to a paved transit facility with the implementation of the proposed project. Conversations with U.S. Fish and Wildlife Service and California Department of Fish and Wildlife personnel suggest similar or greater quality habitat be preserved and managed for the benefit of Golden eagle at the same amount that would be impacted to achieve a no net loss is habitat. Therefore, Caltrans will purchase and preserve in perpetuity at least the same amount of acres of suitable Golden eagle foraging habitat that is permanently affected.

4.4.7.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to

all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.8. Burrowing owl (*Athene cunicularia*): Federal Status-none; State Status-SSC; BLM-Sensitive

4.4.8.1. SURVEY RESULTS

Burrowing owl habitat assessment and focused surveys were conducted throughout the BSA in 2008, 2011, 2012 and 2015. Several breeding pairs, individuals, sign of scat, and sign of active burrows were observed throughout various areas of the project site. For areas of suitable habitat and few observation locations, refer to the burrowing owl consolidated report in Appendix F. Sign or individuals were detected in eastern Palmdale, near the county line, and near the high-speed rail line north and east of the Mojave River.

As stated earlier in Section 3, ECORP Consulting prepared a consolidated report and map set of all burrowing owl surveys conducted to make data review easier. Because the proposed project limits changed over time, and due to restrictions in State contracting rules, areas within the project limits were studied during different years. In 2015 Caltrans conducted a focused burrowing owl survey to cover the entire BSA and surrounding buffer zones.

In 1993 and again in 2012, California Department of Fish and Wildlife adopted guidelines how to interpret suitable habitat, conduct surveys, analyze impacts and develop appropriate mitigation measures for burrowing owl. In these guidelines the Department suggests that when a burrow is determined to be occupied it should be considered occupied for three years thereafter for impact analysis. Applying this suggestion to the results of the studies conducted is challenging. Because the entire proposed project study area was surveyed in 2015 and in previous years (2008, 2011, and 2012) only portions were surveyed in any of the given year, using the 2015 results would be most current and complete. Also, CEQA guidelines state that evaluation of impacts is based on existing conditions.

Results of the 2015 comprehensive focused survey resulted in three confirmed breeding pairs, two were successful in fledging seven young each and the third pairs' attempt appeared to have failed. Refer to the map set provided in the Consolidated Burrowing Owl Report for locations. AMEC's field study of San Bernardino County in 2011 resulted in two individual owls, each within separate burrows and presumed to represent a breeding pair, and their 2012 survey resulted in three breeding pairs within the same area. ECORP's study of Los Angeles County in 2008 resulted in three individuals noted within burrows each thereby representing a breeding pair for a total of three pairs in Los Angeles County. Breeding success for AMEC and

ECORP observations was not determined. Additional burrows with sign were noted but none were confirmed to be active.

4.4.8.2. AVOIDANCE AND MINIMIZATION EFFORTS

This species has the potential for occurring during the construction phase. Avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

Burrowing owl is listed as California Species of Special Concern. It could be said that no other species that is only listed as CA SSC receives so much attention and consideration when evaluating impacts and determining appropriate mitigation. Because this species is not afforded protection under the Endangered Species Act or the California Endangered Species Act at this time, impact analysis and mitigation measures are addressed in this CEQA document only. Focused surveys for this species are not required in the future prior to construction. However, the Migratory Bird Treaty Act prohibits take of active nests. Because of the burrowing nature of this animal even during the non-breeding season surveys for the presence of this species should occur prior to construction to avoid incidental take. In the event an individual is found to occupy a burrow during the non-breeding season, passive relocation efforts as described in CDFW guidelines should be implemented. Nesting pairs should be avoided during breeding season and allowed to complete their breeding attempt.

4.4.8.3. PROJECT IMPACTS

As stated above, three breeding pairs of burrowing owl were observed within or adjacent to the proposed project impact envelop in the most recent study. Because of their location all three burrows, individuals, and surrounding habitat would be impacted should any of the project alternatives be implemented. Therefore the analysis for impacts to individuals, breeding pairs, and habitat will apply to any of the proposed alternatives equally.

In determining the potential impacts to any individual or breeding pair, one must consider the amount, type and quality of habitat surrounding the active burrow. The map presented in the Consolidated Burrowing Owl Report depicts the location of each of the three active burrows, project limits, and the surrounding area. Habitat type, or plant community type, surrounding the active burrows can be viewed in the map set presented in the Consolidated Plant Community Report. As noted in these reports, burrows #1 and 2 are surrounded by disturbed creosote bush scrub and burrow #3 is located within disturbed rabbbitbrush scrub. As the name of the plant communities suggests, these areas are disturbed natural communities. Because burrowing owl are known to inhabit disturbed areas such as grassland, agricultural

fields, and grazing lands the disturbed nature of these areas should not be misconstrued as lesser quality for burrowing owl.

Determining the amount of occupied burrowing owl habitat that would be impacted by the implementation of the proposed project is more difficult to determine. Several studies conducted in the San Francisco Bay area and the Imperial Valley have determined that the amount of area needed to support a breeding pair can vary from one habitat type to another. According to these studies approximately 80% of all observations occur within a radius of 600 meters of the burrow. With this in mind we estimate that each pair can use approximately 280 acres of suitable habitat. When viewing available suitable habitat surrounding burrows #1-3, we find similar amounts of suitable habitat available for each of these pairs.

4.4.8.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.8.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to burrowing owl have the potential to occur. Burrowing owl habitat occurs throughout the proposed project corridor, within dry grasslands, agricultural and range lands, railroad rights-of-way, margins of highways, golf courses, and airports. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.8.4.2. Main A/Variation A

Potential impacts to the burrowing owl may occur with the implementation of this segment. The burrowing owl's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main A would require fewer acres of permanent and temporary impacts to dry grasslands, agricultural and range lands, railroad rights-of-way, margins of highways, golf courses, and airports, when compared to the Variation A, as it traverses less distance along existing roadways.

4.4.8.4.3. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the burrowing owl, and with the implementation of this segment, impacts to the burrowing owl may occur. However, with the above mentioned avoidance and minimization measures, impacts to burrowing owl are expected to be low. Main B has the potential to have impact on burrowing owl habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to dry grasslands, agricultural and range lands, railroad rights-of-way, margins of highways, golf courses, and airports, in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.8.4.4. Main D/Variation D

Potential impacts to the burrowing owl may occur with the implementation of this segment. The burrowing owl's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to dry grasslands, agricultural and range lands, railroad rights-of-way, margins of highways, golf courses, and airports, in comparison to Variation D, due to the alignment encompassing a smaller area.

4.4.8.4.5. Main E/Variation E

Potential habitat for the burrowing owl occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to burrowing owl habitat if implemented.

4.4.8.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.8.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to burrowing owl have the potential to occur. Burrowing owl habitat occurs throughout the proposed project corridor, within dry grasslands, agricultural and range lands, railroad rights-of-way, margins of highways, golf courses, and airports. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.8.5.2. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the burrowing owl, and with the implementation of this segment, impacts to the burrowing owl may occur. However, with the above mentioned avoidance and minimization measures, impacts to burrowing owl are expected to be low. Main B has the potential to have impact on burrowing owl habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to dry grasslands, agricultural and range lands, railroad rights-of-way, margins of highways, golf courses, and airports, in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.8.5.3. Main D/Variation D

Potential impacts to the burrowing owl may occur with the implementation of this segment. The burrowing owl's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to dry grasslands, agricultural and range lands, railroad rights-of-way, margins of highways, golf courses, and airports, in comparison to Variation D, due to the alignment encompassing a smaller area.

4.4.8.5.4. Main E/Variation E

Potential habitat for the burrowing owl occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to burrowing owl habitat if implemented.

4.4.8.5.4.1. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

This rail options include areas that are potential habitat to the burrowing owl, and with the implementation of either option, impacts to the burrowing owl may occur. However, with the above mentioned avoidance and minimization measures, impacts to burrowing owl are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.8.6. COMPENSATORY MITIGATION

Acceptable mitigation for impacts to a burrowing owl breeding pair would be to preserve suitable habitat and manage it for the benefit of burrowing owl in perpetuity. CDFW guidelines suggest that such land should be of similar type and of equal or greater quality to ensure a no net loss. As such approximately 840 acres of suitable burrowing owl habitat should be preserved.

4.4.8.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.9. Short-eared owl (*Asio flammeus*) Federal Status-none State Status- SSC

4.4.9.1. SURVEY RESULTS

Suitable habitat for this species is present and one individual was observed within the limits of the project on site visits.

4.4.9.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.9.3. PROJECT IMPACTS

The implementation of the proposed project has the potential to impact this species during the construction phase of this project. Because this species has the ability to fly away, direct impacts to individual adults are not expected during the construction phase of this project. Potential exists for impacts to nesting birds should they be present. With the implementation of the above stated avoidance and minimization measures, impacts to this species will be minimized.

4.4.9.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.9.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the short-eared owl have the potential to occur. Short-eared owl foraging and nesting habitat occurs throughout the proposed project corridor, within swampland, lowland meadows, and irrigated alfalfa fields. Impacts to this species are expected to occur due to construction activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.9.4.2. Main A/Variation A

Potential impacts to the short-eared owl may occur with the implementation of this segment. Short-eared owl preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main A would require fewer acres of permanent and temporary impacts to short-eared owl preferred foraging and nesting habitat of swampland, lowland meadows, and irrigated alfalfa fields, when compared to the Variation A.

4.4.9.4.3. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the short-eared owl, and with the implementation of this segment impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to short-eared owl are expected to be low. Main B has the potential to have impacts on short-eared owl habitat to a lesser extent than Variation B1 and Variation B, as this option traverses less space than these variations and at one location, bisects farmland which is not considered suitable habitat. Variation B requires considerably

more acres of temporary and permanent impact to short-eared owl preferred foraging and nesting habitat of swampland, lowland meadows, and irrigated alfalfa fields in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.9.4.4. Main D/Variation D

Potential impacts to the short-eared owl may occur with the implementation of this segment. Short-eared owl preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat swampland, lowland meadows, and irrigated alfalfa fields in comparison to Variation D, due to encompassing a smaller area.

4.4.9.4.5. Main E/Variation E

Potential habitat for the short-eared owl occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to short-eared owl foraging and nesting habitat if implemented.

4.4.9.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.9.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the short-eared owl have the potential to occur. Short-eared owl foraging and nesting habitat occurs throughout the proposed project corridor, within swampland, lowland meadows, and irrigated alfalfa fields. Impacts to this species are expected to occur due to construction activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.9.5.2. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the short-eared owl, and with the implementation of this segment impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to short-eared owl are expected to be low. Main B has the potential to have impacts on short-eared owl habitat to a lesser extent than Variation B1 and Variation B, as this option traverses less space than these variations and at one location, bisects farmland which is not considered suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to short-eared owl preferred foraging and nesting habitat of swampland, lowland meadows, and irrigated alfalfa fields in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.9.5.3. Main D/Variation D

Potential impacts to the short-eared owl may occur with the implementation of this segment. Short-eared owl preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat swampland, lowland meadows, and irrigated alfalfa fields in comparison to Variation D, due to encompassing a smaller area.

4.4.9.5.4. Main E/Variation E

Potential habitat for the short-eared owl occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to short-eared owl foraging and nesting habitat if implemented.

4.4.9.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the short-eared owl, and with the implementation of either of these options, impacts to the short-eared owl may occur. However, with the above mentioned avoidance and minimization measures, impacts to the short-eared owl are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the

same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.9.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for short-eared owl will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.9.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.10. Long-eared owl (*Asio otus*) Federal Status-none State Status-SSC

4.4.10.1. SURVEY RESULTS

Suitable habitat for this species is present and one individual was observed within the limits of the project on site visits.

4.4.10.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.10.3. PROJECT IMPACTS

The implementation of the proposed project has the potential to impact this species during the construction phase of this project. Because this species has the ability to fly away, direct impacts to individual adults are not expected during the construction phase of this project. Potential exists for impacts to nesting birds should they be present. With the implementation of the above stated avoidance and minimization measures, impacts to this species will be minimized.

4.4.10.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.10.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the long-eared owl have the potential to occur. Long-eared owl foraging and nesting habitat occurs throughout the proposed project corridor, within open space and shrublands. Impacts to this species are expected to occur due to construction activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.10.4.2. Main A/Variation A

Potential impacts to the long-eared owl may occur with the implementation of this segment. Long-eared owl preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main A would require fewer acres of permanent and temporary impacts to long-eared owl preferred foraging and nesting habitat of swampland, lowland meadows, and irrigated alfalfa fields, when compared to the Variation A.

4.4.10.4.3. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the long-eared owl, and with the implementation of this segment impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to long-eared owl are expected to be low. Main B has the potential to have impacts on long-eared owl habitat to a lesser extent than Variation B1 and Variation B, as this option traverses less space than these variations and at one location, bisects farmland which is not considered suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to long-eared owl preferred foraging and nesting habitat of swampland, lowland meadows, and irrigated alfalfa fields in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.10.4.4. Main D/Variation D

Potential impacts to the long-eared owl may occur with the implementation of this segment. Long-eared owl preferred foraging and nesting habitat type is known to

occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat swampland, lowland meadows, and irrigated alfalfa fields in comparison to Variation D, due to encompassing a smaller area.

4.4.10.4.5. Main E/Variation E

Potential habitat for the long-eared owl occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to long-eared owl foraging and nesting habitat if implemented.

4.4.10.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.10.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the long-eared owl have the potential to occur. Long-eared owl foraging and nesting habitat occurs throughout the proposed project corridor, within swampland, lowland meadows, and irrigated alfalfa fields. Impacts to this species are expected to occur due to construction activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.10.5.2. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the long-eared owl, and with the implementation of this segment impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to long-eared owl are expected to be low. Main B has the potential to have impacts on long-eared owl habitat to a lesser extent than Variation B1 and Variation B, as this option traverses less space than these variations and at one location, bisects farmland which is not considered suitable habitat. Variation B requires considerably more

acres of temporary and permanent impact to long-eared owl preferred foraging and nesting habitat of swampland, lowland meadows, and irrigated alfalfa fields in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.10.5.3. Main D/Variation D

Potential impacts to the long-eared owl may occur with the implementation of this segment. Long-eared owl preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat swampland, lowland meadows, and irrigated alfalfa fields in comparison to Variation D, due to encompassing a smaller area.

4.4.10.5.4. Main E/Variation E

Potential habitat for the long-eared owl occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to long-eared owl foraging and nesting habitat if implemented.

4.4.10.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the long-eared owl, and with the implementation of either of these options, impacts to the long-eared owl may occur. However, with the above mentioned avoidance and minimization measures, impacts to the long-eared owl are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.10.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for long-eared owl will incidentally

be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.10.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.11. Swainson's hawk (*Buteo swainsoni*): Federal Status-none; State Status- Threatened

4.4.11.1. SURVEY RESULTS

No individuals of this species were noted within the BSA during the 2015 focused survey and other site visits. However, a record search and interviews with professional raptor experts was conducted and several nest sites were observed north and west of the project envelop during 2015 during studies unrelated to this proposed project. Suitable habitat for this species was noted in various locations at the west end of the project site.

4.4.11.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.11.3. PROJECT IMPACTS

Suitable foraging habitat was observed within the limits of this proposed project. As such, the implementation of the proposed project has the potential to impact this species during the construction phase and during the continued use of the facility after construction. Although no known nesting sites occur within the limits of the project, one potential impact may occur when individuals attempt to hunt in suitable habitat where nests are known to occur near the west end of the project site. Because adults of this species have the ability to fly away, direct impacts to individual adults are not expected during the construction phase of this project. Individuals hunting near the completed facility would have to avoid vehicles traveling at high speeds. Because vehicle/bird strikes are known to occur, there is potential for individual mortality. With the implementation of BTE-1, BTE-3, [MW6]and BAN-6 [this measure requires installation of fencing that would reduce the potential for roadkill that may attract Swainson’s hawk to the freeway], the potential for impacts would be

reduced to the point where Swainson's hawk mortality is not expected. In addition, the accidental taking of a Swainson's hawk by collision with a motor vehicle while the vehicle is being operated on a highway is not a violation of the FGC.

Implementation of this proposed project would permanently convert suitable foraging habitat at the west end of the site to a paved highway/transit facility. The amount of suitable foraging habitat can be challenging to determine. The "Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California" prepared by the State of California Energy Commission and Department of Fish and Game June 2010, was reviewed and provides guidance on this issue. It states "monitoring/mitigation recommendations suggest surveys and acquisition of mitigation lands prior to construction of the project if nests are found within five miles of a project site." When nest sites within a five-mile radius of the proposed project are mapped relative to the project boundary we find 4 nest foraging territories overlapping with the project limits. These areas can be viewed on the map set in the Consolidated Raptor Survey Report, Appendix L. The conversion of these areas will result in the permeanent loss of Swainson's hawk foraging habitat. The amount of permanent foraging habitat depends on which alternative and variation is selected. The maximum amount of permanent impacts to foraging Swainson's hawk habitat is 1,263.58 acres and the maximum amount of temporary impacts is 690.74 acres. Because suitable foraging habitat occurs only at the west end of the project site, only differences among Variations 1A, 1B, 1B, 7A, 7B, 7C, Freeway Expressway, and Freeway Expressway with HSR Alternative in the Palmdale area are further discussed below.

4.4.11.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent by approximately 85 acres because of the reduced area of impact.

Impacts to Swainson's hawk foraging habitat located within five miles of known nest sites are described below. Table 11 contains the amount of occupied habitat per species within each Variation of this Alternative for which the acreages stated below are derived from.

4.4.11.4.1. Main Alignment/Common Areas

Approximately 781.73 acres of foraging habitat exists within five miles of a known Swainson's hawk nest within this segment. Approximately 463.67 acres would be permanently impacted. Approximately 318.06 acres would be temporarily impacted.

Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.11.4.2. Main A

Approximately 303.51 acres of foraging habitat exists within five miles of a known Swainson's hawk nest within this segment. Approximately 206.73 acres would be permanently impacted and approximately 96.78 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.11.4.3. Variation A

Approximately 308.06 acres of foraging habitat exists within five miles of a known Swainson's hawk nest within this segment. Approximately 209.09 acres would be permanently impacted and approximately 98.97 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced

4.4.11.4.4. Main E

Approximately 398.40 acres of foraging habitat exists within five miles of a known Swainson's hawk nest within this segment. Approximately 299.05 acres would be permanently impacted and approximately 99.35 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.11.4.5. Variation E

Approximately 376.70 acres of foraging habitat exists within five miles of a known Swainson's hawk nest within this segment. Approximately 168.45 acres would be permanently impacted and approximately 208.25 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.11.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) without HSR Alternative, and therefore impacts to habitat for this species would be higher by approximately 10 acres. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to

habitat for this species. Table 12 and 13 contains the amount of occupied habitat per species within each Variation of this Alternative for which the acreages stated below are derived from.

4.4.11.5.2. Main Alignement/Common Areas

Approximately 786.90 acres of foraging habitat exists within five miles of a known Swainson's hawk nest within this segment. Approximately 503.14 acres would be permanently impacted and approximately 283.76 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.11.5.3. Main A

Approximately 385.79 acres of foraging habitat exists within five miles of a known Swainson's hawk nest within this segment. Approximately 325.22 acres would be permanently impacted and approximately 60.57 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.11.5.4. Main E

Approximately 637.81 acres of foraging habitat exists within this segment. Approximately 397.73 acres would be permanently impacted and approximately 240.08 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.11.5.5. Variation E

Approximately 622.17 acres of foraging habitat exists within five miles of a known Swainson's hawk nest within this segment. Approximately 393.21 acres would be permanently impacted and approximately 228.96 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.11.5.6. Option 1A

Approximately 31.65 acres of foraging habitat exists within five miles of a known Swainson's hawk nest within this segment. Approximately 1.34 acres would be permanently impacted and approximately 30.31 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.11.5.7. Option 1B

Approximately 29.60 acres of foraging habitat exists within five miles of a known Swainson's hawk nest within this segment. Approximately 0.03 acres would be permanently impacted and approximately 29.57 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.11.5.8. Option 1C

Approximately 43.61 acres of foraging habitat exists within five miles of a known Swainson's hawk nest within this segment. Approximately 5.48 acres would be permanently impacted and approximately 38.13 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.11.5.9. Option 7A

Approximately 71.20 acres of foraging habitat exists within five miles of a known Swainson's hawk nest within this segment. Approximately 22.56 acres would be permanently impacted and approximately 48.64 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.11.5.10. Option 7B

Approximately 70.35 acres of foraging habitat exists within five miles of a known Swainson's hawk nest within this segment. Approximately 24.13 acres would be permanently impacted and approximately 46.22 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.11.5.11. Option 7C

Approximately 100.21 acres of foraging habitat exists within five miles of a known Swainson's hawk nest within this segment. Approximately 32.01 acres would be permanently impacted and approximately 68.20 acres would be temporarily impacted. Through implementation of the above avoidance and minimization measures impacts would be reduced.

4.4.11.6. COMPENSATORY MITIGATION

As stated above, depending on the alternative, variation, and option that are chosen up to approximately 1,263 acres of suitable foraging habitat for Swainson's hawk could be permanently converted to a paved transit facility with the implementation of the proposed project. The document "Swainson's Hawk Survey Protocols, Impact

Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California" and additional conversations with California Department of Fish and Wildlife personnel suggest similar or greater quality habitat be preserved and managed for the benefit of Swanson's hawk at the same amount that would be impacted to achieve a no net loss is habitat. Therefore, Caltrans will purchase and preserve in perpetuity at least the same amount of acres of suitable Swainson's hawk foraging habitat that is permanently affected.

4.4.11.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.12. Mountain plover (*Charadrius montanus*): Federal Status-none; State Status-SSC; BLM-Sensitive

4.4.12.1. SURVEY RESULTS

No individuals of this species were noted within the BSA during site visits. However, suitable habitat for this species is present and this species could occur on the project site in the future during construction phase.

4.4.12.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.12.3. PROJECT IMPACTS

The implementation of the proposed project has the potential to impact this species during the construction phase of this project. Because this species has the ability to fly away, direct impacts to individual adults are not expected during the construction phase of this project. Potential exists for impacts to nesting birds should they be present. With the implementation of the above stated avoidance and minimization measures, impacts to this species will be minimized.

4.4.12.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.12.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the mountain plover have the potential to occur. Mountain plover foraging and nesting habitat occurs throughout the proposed project corridor, within heavily grazed, short grass prairie, xeric scrub and fallow fields. Impacts to this species are expected to occur due to construction activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.12.4.2. Main A/Variation A

Potential impacts to the mountain plover may occur with the implementation of this segment. Mountain plover preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main A would require fewer acres of permanent and temporary impacts to mountain plover preferred foraging and nesting habitat of heavily grazed, short grass prairie, xeric scrub and fallow fields, when compared to the Variation A.

4.4.12.4.3. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the mountain plover, and with the implementation of this segment impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to mountain plover are expected to be low. Main B has the potential to have impacts on mountain plover habitat to a lesser extent than Variation B1 and Variation B, as this option traverses less space than these variations and at one location, bisects farmland which not considered suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to mountain plover preferred foraging and nesting habitat of heavily grazed, short grass prairie, xeric scrub and fallow fields in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.12.4.4. Main D/Variation D

Potential impacts to the mountain plover may occur with the implementation of this segment. Mountain plover preferred foraging and nesting habitat type is known to

occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat of heavily grazed, short grass prairie, xeric scrub and fallow fields in comparison to Variation D, due to traversing a shorter distance.

4.4.12.4.5. Main E/Variation E

Potential habitat for the mountain plover occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to mountain plover foraging and nesting habitat if implemented.

4.4.12.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.12.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the mountain plover have the potential to occur. Mountain plover foraging and nesting habitat occurs throughout the proposed project corridor, within heavily grazed, short grass prairie, xeric scrub and fallow fields. Impacts to this species are expected to occur due to construction activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.12.5.2. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the mountain plover, and with the implementation of this segment impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to mountain plover are expected to be low. Main B has the potential to have impacts on mountain plover habitat to a lesser extent than Variation B1 and Variation B, as this option traverses less space than these variations and at one location, bisects farmland which not considered suitable habitat. Variation B requires considerably

more acres of temporary and permanent impact to mountain plover preferred foraging and nesting habitat of heavily grazed, short grass prairie, xeric scrub and fallow fields in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.12.5.3. Main D/Variation D

Potential impacts to the mountain plover may occur with the implementation of this segment. Mountain plover preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat of heavily grazed, short grass prairie, xeric scrub and fallow fields in comparison to Variation D, due to traversing a shorter distance.

4.4.12.5.4. Main E/Variation E

Potential habitat for the mountain plover occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to mountain plover foraging and nesting habitat if implemented.

4.4.12.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the mountain plover, and with the implementation of these options, impacts to the mountain plover may occur. However, with the above mentioned avoidance and minimization measures, impacts to the mountain plover are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.12.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for mountain plover will

incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.12.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.13. Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*): Federal Status-Threatened; State Status-Endangered

4.4.13.1. SURVEY RESULTS

No individuals of this species were noted within the BSA during site visits. However, suitable habitat for this species is present and this species could occur on the project site in the future during construction phase.

4.4.13.2. AVOIDANCE AND MINIMIZATION EFFORTS

No impacts to this species are expected, due to the focused surveys that have not detected individuals. As such, no avoidance and minimization measures are required.

4.4.13.3. PROJECT IMPACTS

This species is a riparian obligate species primarily within willow-cottonwood riparian forests. Since only a few variations contain this type of habitat, others are eliminated from discussion. Variation E Main and Variation E for both the Freeway Expressway (Freeway/Tollway) Alternative and Freeway Expressway (Freeway/Tollway) with HSR Alternative are discussed below. No impacts to this species are expected, due to the focused surveys that have not detected individuals.

Caltrans submitted a Biological Assessment to the USFWS (October 2015) based on Variation E *Main Freeway/Expressway and Freeway/Tollway Alternatives with HSR Feeder Service* (Preferred Alternative). Caltrans determined that the project would have no effect to Western yellow-billed cuckoo because of negative focused surveys and lack of adequate suitable habitat. Therefore, Avoidance and Mitigation Measures are not necessary. The habitat patches are not large enough for cuckoo presence, as they are known to occupy very large, wide areas of riparian habitat, up to 2,000 ft

in width and have not been documented nesting in isolated patches 1 to 2 acres in size or in narrow corridors 30 to 60 ft (9 to 18 m) in width (Halterman, et al. 2015).

4.4.13.4. COMPENSATORY MITIGATION

No impacts to this species are expected, due to the focused surveys that have not detected individuals. As such, no compensatoiry mitigation is required.

4.4.13.5. CUMULATIVE EFFECTS

No impacts to this species are expected, due to the focused surveys that have not detected individuals. As such, no cumulative effects are anticipated.

4.4.14. Southwestern willow flycatcher (*Empidonax trailii extimus*): Federal Status-Endangered; State Status-Endangered

4.4.14.1. SURVEY RESULTS

Several individuals displaying nesting behavior were observed within the BSA in specific areas along the Mojave River. Surveys conducted where the main alignment intersects with the Mojave River has yielded no observations of individuals or nesting behavior of this species. Individuals and nesting behavior has only been observed in the area where Variation E of the Freeway/Expressway (Freeway/Tollway) with HSR Alternative rail line intersects the Mojave River.

4.4.14.2. AVOIDANCE AND MINIMIZATION EFFORTS

The main alignment alternative would completely avoid and minimize impacts to this species in addition to all other Variations with the exception of Variation E of the Freeway/Expressway (Freeway/Tollway) with HSR Alternative.

Should the Variation E of the Freeway/Expressway (Freeway/Tollway) with HSR Alternative be chosen as the preferred alternative, the following avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.14.3. PROJECT IMPACTS

This species is a riparian obligate species requiring riparian forest with a dense understory. Since only Variation E Main and Variation E contain such habitats, other alignments are eliminated from discussion. Variation E Main and Variation E of the Freeway/Expressway (Freeway/Tollway) Alternative and the Freeway/Expressway (Freeway/Tollway) with HSR Alternatives are discussed below.

Direct and indirect impacts to southwestern willow flycatcher have the potential to occur. Impacts to this species are expected to occur during the construction phase of

the selected Variation/Alternative. With the incorporation of minimization measures BTE-4 through BTE-10 from the Biological Assessment and incorporated by reference in the Biological Opinion, which were developed in consultation with CDFW to ensure consistency, the impacts to individuals of this species is expected to be low except in the Variation E Highway and Rail Alternative. Below is a discussion of direct and indirect impacts that could occur as a result of the implementation of the proposed project. The discussion is applicable to Variation E and Variation E Main in each Alternative that provides suitable habitat.

Table 8 below shows the amount of critical habitat within the Variation E Main and Variation E, broken down by vegetation community. The “None” column refers to the bridges associated with Variation E Main where the proposed facilities would cross over the vegetation communities without permanent or temporary impacts.

Table 8: Southwestern Willow Flycatcher Critical Habitat Impact Acreages[1]

Plant Communities	Variation E Main			Variation E	
	None	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact
Freeway/Expressway and Freeway/Tollway Alternatives					
Allscale scrub Alliance		1.90	0.04		
California bulrush-American bulrush marsh	0.20			0.16	0.18
Developed			0.07	0.04	0.12
Disturbed			0.53	0.11	0.12
Disturbed Allscale scrub Alliance		0.00	0.02		
Disturbed Creosote bush scrub Alliance			0.09	0.19	0.04
Fourwing saltbush scrub Alliance		1.85	1.29	0.04	0.03
Fremont cottonwood forest Alliance	0.31	1.63	0.13	0.23	0.50
Mojave yucca scrub Alliance			0.01		
Non-native grassland	0.00				
Rock outcrop		0.09	0.76	0.00	0.23
Sandbar willow thickets Alliance	0.34			0.79	0.71
Southern cattail marsh				0.22	0.29
Unvegetated wash	0.14			0.14	0.08
Total	**0.99**	**5.47**	**2.94**	**1.92**	**2.3**
Freeway/Expressway and Freeway/Tollway Alternatives with HSR Feeder Service					
Allscale scrub Alliance		2.34		0.01	
California bulrush-American bulrush marsh	0.18			0.25	0.11
Developed			0.07	0.27	0.07
Disturbed		0.03	0.56	1.10	0.06
Disturbed Allscale scrub Alliance		0.05	0.04		

Disturbed Creosote bush scrub Alliance				0.19	0.02
Fourwing saltbush scrub Alliance		2.14	1.96	0.04	0.03
Fremont cottonwood forest Alliance	0.27	3.17	0.07	2.38	0.30
Mojave yucca scrub Alliance		0.00	0.32		
Non-native grassland	0.13				
Red willow thickets				1.01	
Rock outcrop		0.18	0.57	0.00	0.10
Sandbar willow thickets Alliance	0.45		0.04	0.98	0.40
Southern cattail marsh				0.22	0.16
Unvegetated wash	0.13			0.43	0.07
Total	**1.16**	**7.91**	**3.63**	**6.88**	**1.32**

[1]This table presents all vegetation communities and land cover types occurring within the southwestern willow flycatcher critical habitat.

4.4.14.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Table 11 contains the amount of occupied habitat per species within each Variation of this Alternative for which the acreages stated below are derived from.

4.4.15.4.5. Main E

Based on the four years of focused surveys for this species, observations indicate the reach of the Mojave River that intersects with the Variation E Main does not support this species; therefore this Variation is not occupied habitat. Southwestern willow flycatchers (including migrants) were not detected within 1,000 feet of Variation E Main. Variation E Main is entirely within designated critical habitat for this species. Habitat quality and suitability for this species in Variation E Main are discussed further below. Spanning the Mojave River with a bridge following the Variation E Main would have low impacts to potentially suitable habitat.

Impacts to southwestern willow flycatcher critical habitat are expected to be low and would not jeopardize the continued existence of this species in this area along the Mojave River. Table 9 below summarizes the impacts to Southwestern willow flycatcher critical habitat within the Variation E Main using only the suitable habitat types for the species. Variation E Main crosses through southwestern willow flycatcher critical habitat within the Mojave River and its greater floodplain. Specifically, it crosses at two locations: one across the Mojave River at the proposed bridge location and a floodplain area west of Gas Line Road to approximately 0.3 mile west of Matthews Lane. Currently, 0.65 acre would not be affected (bridge over Mojave River), 1.63 acres would be permanently impacted, and 0.13 acre would be temporarily affected, for a total of 2.41 acres of low quality riparian habitat within the Variation E Main Freeway/Expressway and Freeway/Tollway Alternatives. The riparian vegetation where the project would cross critical habitat is of poor quality in

terms of supporting the large, dense stands of mixed -height riparian vegetation that comprises southwestern willow flycatcher critical habitat; therefore, impacts to designated critical habitat for the southwestern willow flycatcher are not anticipated. This habitat does not contain the physical and biological features necessary to support this species.

Table 9: Southwestern Willow Flycatcher Critical Habitat Impact (in acres)[1]

Southwestern Willow Flycatcher Critical Habitat	Variation E Main			Variation E	
	None	Permanent Impact	Temporary Impact	Permanent Impact	Temporary impact
Freeway/Expressway and Freeway/Tollway Alternatives					
Southwestern Willow Flycatcher Critical Habitat	0.65*	1.63*	0.13*	1.02*	1.21*
Freeway/Expressway and Freeway/Tollway Alternatives with HSR Feeder Service					
Southwestern Willow Flycatcher Critical Habitat	0.72*	3.17*	0.11*	4.37	0.70

[1]This table is a summary of the suitable habitat types for southwestern willow flycatcher available in critical habitat within each Variation.
*Note: The vegetation communities that make up this acreage amount in this variation do not provide the PCEs for SWFL Critical Habitat.

Table 10: Southwestern Willow Flycatcher Critical Habitat Impacts in Preferred Alternative (in acres)[1]

Variation E Main		
None	Perm*	Temp*
0.72	3.17	0.11

*Note: The vegetation communities in this variation do not provide the PCEs for SWFL Critical Habitat.
[1] This table represents the amount of impacts to southwestern willow flycatcher critical habitat in the Preferred Alternative, which is made up of the Main Alignment/Common Areas, Variation A Main, Variation D, Variation B1, Variation E Main, and Rail Option 1C of the Freeway/Expressway and Freeway/Tollway Alternatives with HSR Feeder Service. Variation E Main is the only component of the Preferred Alternative that contains southwestern willow flycatcher critical habitat. It is noted that the Biological Assessment (October 2015) reported that 3.24 acres of permanent impacts and 0.07 acre of temporary impacts would occur to Southwestern willow flycatcher critical habitat as a result of the Preferred Alternative. However, in November 2015 slight modifications occurred to the Variation E Main footprint, thereby reducing the amount of permanent impacts and slightly increasing the amount of temporary impacts. Therefore, the impacts to critical habitat presented in the BA and the BO do not exactly match those reported here.

Permanent and temporary habitat loss for southwestern willow flycatcher and southwestern willow flycatcher critical habitat would occur as a result of construction activities; however, it would not occur in all riparian habitat within the project. In general, riparian habitat within 1,000 feet upstream and downstream (identified as the action area in BA) is very poor and does not contain the appropriate nesting requirements (e.g., dense vegetative cover and structural diversity) for southwestern willow flycatcher. Under Variation E Main, permanent and temporary habitat loss

would occur in the stretch of riparian vegetation west of Gas Line Road, approximately one mile west of the Mojave River. Temporary impacts would occur to 0.13 acre of Fremont cottonwood forest alliance and permanent impacts would occur to 1.63 acres of Fremont cottonwood forest. The Fremont cottonwood forest alliance at this location does not provide suitable habitat for this species because it is small in size, has a sparsely vegetated understory, and the cottonwood trees are unhealthy; therefore, it is anticipated that this habitat removal would not have a direct effect to this species.

Shading effects from the newly constructed bridge over the Mojave River are not expected to affect riparian vegetation below the bridge. Existing riparian vegetation in this area is sparse, so effects from shade to the vegetation beneath the bridge would be minimal. Furthermore, the bridge is designed to be at least 80 ft (24 m) above the ground and will have three separate bridge decks, one each for eastbound and westbound vehicular traffic and one for rail travel. The height and design of the three narrow bridge decks will allow ample sunlight to the areas below the bridge. There are other bridges over the Mojave River in the area and include: National Trails Highway, the BNSF Railroad (bridges both east and west of I-15), and the I-15 bridge. Although the bridges are not the same height, construction technique, or orientation of the proposed bridge, they do show that riparian vegetation continues to grow underneath and directly adjacent to the bridges despite any shading to the vegetation from the bridge structures.

Direct impacts in the form of vehicle-wildlife collisions for willow flycatcher individuals are not likely to occur because the height of the bridge spanning the Mojave River would be at least 80 feet above the river, which is high enough that birds are more likely to fly under, rather than over, the bridge if traveling north-south along the Mojave River.

Indirect impacts associated with noise, vibration, increased human activity and visual disturbance, light disturbance, and water quality could also occur as a result of the project. These indirect impacts are not expected to affect southwestern willow flycatcher based on the lack of suitable nesting habitat and the distance from the alignment to the closest observed nest.

During construction activities, noise levels are not expected to exceed 105 dB at 50 ft (15 m) from the noise source (Jin Lee, Caltrans, personal communication, July 28, 2015). Based on this measurement, projected noise levels at 1,000 ft (305 m) from the source are expected to be 80 dB. This level is a one-time measurement, it is not the averaged noise level over the period of an hour, which is the standard measurement used when determining noise impacts to breeding birds. Noise impacts to bird species are typically measured at 60 dB averaged over an hour (dBA)

at a certain distance from the noise source. With the equipment planned for project use, it is expected that noise levels will not be sustained at 105 dB for longer than a few seconds during construction activities. This activity may be repeated every few seconds or so, but the period of lower noise levels averages with the high noise levels to be substantially lower than 80 dBA at 1,000 ft (305 m) from the source. Furthermore, Variation E Main is located in an area with steep walls and curves, further diminishing construction activity noise and preventing it from reaching the upstream areas where southwestern willow flycatchers were detected. Noise levels are not expected to exceed 60 dBA at 1,000 ft (305 m) from the boundaries of Variation E Main.

Existing ambient noise levels at Rockview Nature Park, located adjacent to Variation E Main to the north, were measured at 42 dBA (Caltrans 2014). Noise projections found that this location would be projected to increase to 53 dBA during the worst traffic conditions (e.g., rush hour traffic) after the roadway is constructed.

Increased noise levels during and after construction are not expected to affect nesting activities for southwestern willow flycatcher because suitable nesting habitat is not present within the action area for either of these species. Higher quality and more suitable southwestern willow flycatcher habitat is located upstream that this species is more likely to nest in (and was found in during focused surveys). Furthermore, the closest listed bird nest that has been documented to Variation E Main during focused surveys was a least Bell's vireo nest documented approximately 2,600 ft (792 m) away. Successful southwestern willow flycatcher nesting has not been documented during focused surveys within the action area.

Based on the lack of suitable nesting habitat, the distance from Variation E Main that the closest nest was documented (least Bell's vireo), and the lack of southwestern willow flycatcher observations within the action area (nesting and individual), noise impacts are not expected to occur to nesting southwestern willow flycatchers.

Increased human activity and visual disturbances associated with the project are not expected to create impacts to southwestern willow flycatchers because homeless encampments, OHV use, and other evidence of human activity (e.g., trash and graffiti) are currently prevalent in the area where southwestern willow flycatchers were found. Construction of the bridge and new roadway may attract additional human activity to the area, but this increase is not anticipated to be substantially more than what is already present in the area.

Ground-based vibration resulting from the use of heavy equipment and large vehicles used during the construction phase of the project is not expected to be an impact to southwestern willow flycatchers because this species was not found to

breed within the action area because of low quality habitat. Ground-based vibration is not expected to create impacts to migratory individuals because the area is currently subjected to a high level of ground vibrations from the nearby BNSF railroad and busy roads throughout the area. The higher quality habitat located upstream (south) of the action area is more likely to attract migrating individuals than the small and sparsely vegetated riparian vegetation within the action area.

The lighting on the new bridge over the Mojave River, the viaduct west of Gas Line Road, and along constructed roadways would consist of directional lighting that focuses the light towards the roadway and the HSR. Southwestern willow flycatchers have not been documented within 2,600 ft (792 m) of Variation E Main. At this distance, the nighttime lighting effects from the roadway would be substantially reduced by the presence of vegetation and the distance away from the light source.

The closest listed bird nest that has been documented to Variation E Main during focused surveys was a least Bell's vireo nest documented approximately 2,600 ft (792 m) away. Successful southwestern willow flycatcher nesting has not been documented during focused surveys in the action area.

No impacts to southwestern willow flycatchers are expected to occur as a result of nighttime light disturbance.

A Storm Water Pollution Prevention Plan (SWPPP) would be prepared for the project prior to construction in order to obtain National Pollutant Discharge Elimination System permit coverage for storm water discharges. SWPPP BMPs would be implemented to ensure that construction does not adversely affect water quality from the use, for example, of petroleum products (e.g., fuels, oil, and lubricants) and erosion of land cleared during construction.

Operation of the highway could have potential long-term water quality impacts associated with the generation of urban contaminants from vehicles (e.g., oil, debris, litter); however, implementation of site design/Low Impact Development measures would effectively capture, filter, store, evaporate, detain, and/or infiltrate runoff close to its source. Additionally, source control BMPs would be used to avoid or minimize the introduction of pollutants into natural drainages by reducing on-site pollutant generation and off-site pollutant transport. The source control BMPs would help to improve long-term water quality by avoiding or minimizing pollutant generation and exposure to storm flows at the source.

The USFWS has issued a Biological Opinion (April 2016) for southwestern willow flycatcher and southwestern willow flycatcher critical habitat based on Variation E Main Freeway/Expressway and Freeway/Tollway Alternatives with HSR Feeder

Service. The determination is that the project is not likely to adversely affect this species or its critical habitat. The project is not likely to adversely affect these biological resources because of low-quality existing habitat within the action area, project design, and the many project measures implemented to protect these resources.

4.4.15.4.5. Variation E

Based on the four years of focused surveys for this species, observations indicate the reach of the Mojave River that intersects with the Variation E does not support this species, therefore this Variation is not occupied habitat. Migrant willow flycatchers were detected in Variation E, however these individuals did not remain in the area for nesting and breeding, therefore not the endangered species. Because of the proximity to Variation E Main, impacts to habitat quality and suitability are similar.

Impacts to southwestern willow flycatcher critical habitat are expected to be low and would not jeopardize the continued existence of this species in this area along the Mojave River. Table 10 above summarizes the impacts to southwestern willow flycatcher critical habitat within Variation E. With this Variation, approximately 0.5 acre of Fremont Cottonwood forest Alliance and 0.71 acre of sandbar willow thickets would be temporarily impacted, while permanent impacts to approximately 0.23 acre of Fremont Cottonwood forest Alliance and 0.79 acre of sandbar willow thickets would occur. Currently, 1.02 acres would be permanently impacted and 1.21 acre would be temporarily affected, making a total of 2.23 acres of low quality riparian habitat within the Variation E Freeway/Expressway and Freeway/Tollway Alternatives. The riparian vegetation where the project would cross critical habitat is of poor quality in terms of supporting the large, dense stands of mixed -height riparian vegetation that comprises southwestern willow flycatcher critical habitat; therefore, impacts to designated critical habitat for the southwestern willow flycatcher would be low. This habitat does not contain the physical and biological features (PCEs) necessary to support this species.

Direct and indirect impacts to this species for this Variation are similar to what is stated above.

4.4.14.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

Table 12 and 13 contains the amount of occupied habitat per species within each Variation of this Alternative for which the acreages stated below are derived from.

4.4.15.5.1. Main E/Variation E

Because of the proximity to Variation E Main Highway only Alternative, impacts to habitat quality and suitability are similar. Based on the four years of focused surveys

for this species, observations indicate the reach of the Mojave River that intersects with the Variation E Main does not support this species, therefore this Variation is not occupied habitat. Spanning the Mojave River with a bridge following the Variation E Main would have low impacts to potentially suitable habitat.

Impacts to southwestern willow flycatcher critical habitat are expected to be low and would not jeopardize the continued existence of this species in this area along the Mojave River. Table 10 above summarizes the impacts to Southwestern willow flycatcher critical habitat within the Variation E Main. Variation E Main crosses through southwestern willow flycatcher critical habitat within the Mojave River and its greater floodplain. Specifically, it crosses at two locations: one across the Mojave River at the proposed bridge location and a floodplain area west of Gas Line Road to approximately 0.3 mile west of Matthews Lane. The riparian vegetation where the project would cross critical habitat is of poor quality in terms of supporting the large, dense stands of mixed -height riparian vegetation that comprises southwestern willow flycatcher critical habitat; therefore, impacts to designated critical habitat for the southwestern willow flycatcher would be low.

The BA (August 2015), which only accounted for impacts to the Preferred Alternative (Variation E Main, Highway and High Speed Rail), state that a total of 4.19 acres of low quality riparian habitat occur within critical habitat, of which 0.88 acre would not be affected; 3.24 acres would be permanently impacted; and 0.07 acre would be temporarily affected. However, this alignment underwent minor engineering revisions in November 2015, and the impacts have been slightly reduced (Table 10). Currently, 0.72 acre would not be affected (bridge over Mojave River); 3.17 acres would be permanently impacted; and 0.11 acre would be temporarily affected, making a total of 4.00 acres of low quality riparian habitat within the Variation E Main Freeway/Expressway and Freeway/Tollway Alternatives with HSR Feeder Service. This habitat does not contain the physical and biological features necessary to support this species.

Direct and indirect impacts to this species for this Variation are similar to what is stated above. With this Variation, approximately 0.07 acre of Fremont Cottonwood forest Alliance and 0.04 acre of sandbar willow thickets would be temporarily impacted, while permanent impacts to approximately 3.17 acres of Fremont Cottonwood forest Alliance would occur.

4.4.15.5.1. Variation E

Based on the four years of focused surveys for this species, observations indicate the reach of the Mojave River that intersects with the Variation E does support this species; therefore, this Variation is considered to contain occupied habitat (Table

3.3.5-5). Nesting (southwestern) willow flycatchers were observed within 200 feet of this Variation, therefore direct and indirect impacts have the potential to occur. With this Variation, the highway and High Speed Rail are split by about 2,500 feet. The Highway portion is adjacent to the Variation E Main and Variation E associated with the Highway only Alternative, which is considered unoccupied and low-quality habitat for this species. Because of this, the occupied portion of this Variation was determined by the records of the species within 1,000 feet of the project boundaries. Although there are a total of 4.77 acres of potentially suitable habitat that could be permanently or temporarily impacted as a result of this Variation, based on the results of surveys, it was determined that 1.86 acres of occupied habitat (which is all designated critical habitat) would be permanently impacted as a result of implementation of this Variation.

Direct impacts to this species would include direct removal of occupied critical southwestern willow flycatcher habitat and potential train collisions with individuals.

The High Speed Rail portion of this Variation is planned to be constructed through occupied habitat. Currently, this habitat is used by southwestern willow flycatchers for breeding, nesting, and raising young. In addition, this habitat may be used by migrant willow flycatchers as a temporary stopover point before nesting in another location.

Indirect impacts associated with noise, vibration, increased human activity and visual disturbance, light disturbance, and water quality could also occur as a result of the project. Each of these impacts are described below.

Although a nesting individual was documented within 200 feet of the project boundary, because there is suitable nesting habitat closer to the project boundary, it is possible for a pair to nest closer than 200 feet. Potential short-term and long-term noise impacts could result if construction or operation noise levels exceed a level of 60 dBA at the nest from the project boundary during the breeding season.

Ground-based vibration resulting from the use of heavy equipment and large vehicles used during the construction phase and from trains during the operation phase of the project is anticipated to occur. If vibration causes the birds to leave their nest or the nest to fail, this would be considered an impact.

The lighting on the new bridge over the Mojave River and along constructed roadways will consist of directional lighting that focuses the light towards the roadway and the HSR. In addition, night-time construction is not anticipated. Because the flycatchers are not expected to nest directly adjacent to the new railway bridge, impacts are anticipated to be minimal.

4.4.14.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for southwestern willow flycatcher will incidentally be preserved.

4.4.14.7. CUMULATIVE EFFECTS

Cumulative effects are not expected to occur since there will be no impacts to this species unless Variation E of the Freeway/Expressway (Freeway/Tollway) with HSR is implemented

Should the Variation E of the Freeway/Expressway (Freeway/Tollway) with HSR line be the preferred option, this project may have a substantial impact on this species. Although no other projects have impacts to the Mojave River and this species, the small size of this area in comparison to the desert region makes the impact high in and of itself, and therefore contributes to a cumulative effect on this species.

4.4.15. Prairie falcon (*Falco mexicanus*): Federal Status-none; State Status-Watchlisted

4.4.15.1. SURVEY RESULTS

Suitable habitat for this species is present and one individual was observed within the limits of the project during site visits.

4.4.15.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.15.3. PROJECT IMPACTS

The implementation of the proposed project has the potential to impact this species during the construction phase of this project. Because this species has the ability to fly away, direct impacts to individual adults are not expected during the construction phase of this project. Potential exists for impacts to nesting birds should they be present. With the implementation of the above stated avoidance and minimization measures, impacts to this species will be minimized.

4.4.15.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.15.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the prairie falcon have the potential to occur. Prairie falcon foraging and nesting habitat occurs throughout the proposed project corridor, within in cliffs or rocky outcrops, open arid valleys and agricultural fields. Impacts to this species are expected to occur due to construction activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.15.4.2. Main A/Variation A

Potential impacts to the prairie falcon may occur with the implementation of this segment. Prairie falcon preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main A would require fewer acres of permanent and temporary impacts to prairie falcon preferred foraging and nesting habitat of cliffs or rocky outcrops, open arid valleys and agricultural fields, when compared to the Variation A.

4.4.15.4.3. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the prairie falcon, and with the implementation of this segment impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to prairie falcon are expected to be low. Main B has the potential to have impacts on prairie falcon habitat to a lesser extent than Variation B1 and Variation B, as this option traverses less space than these variations and at one location, bisects farmland which not considered suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to prairie falcon preferred foraging and nesting habitat cliffs or rocky outcrops, open arid valleys and agricultural fields in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.15.4.4. Main D/Variation D

Potential impacts to the prairie falcon may occur with the implementation of this segment. Prairie falcon preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization

measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat of cliffs or rocky outcrops, open arid valleys and agricultural fields in comparison to Variation D, due to it encompassing a smaller area.

4.4.15.4.5. Main E/Variation E

Potential habitat for the prairie falcon occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to prairie falcon foraging and nesting habitat if implemented.

4.4.15.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.15.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the prairie falcon have the potential to occur. Prairie falcon foraging and nesting habitat occurs throughout the proposed project corridor, within in cliffs or rocky outcrops, open arid valleys and agricultural fields. Impacts to this species are expected to occur due to construction activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.15.5.2. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the prairie falcon, and with the implementation of this segment impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to prairie falcon are expected to be low. Main B has the potential to have impacts on prairie falcon habitat to a lesser extent than Variation B1 and Variation B, as this option traverses less space than these variations and at one location, bisects farmland which not considered suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to prairie falcon preferred foraging and nesting

habitat cliffs or rocky outcrops, open arid valleys and agricultural fields in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.15.5.3. Main D/Variation D

Potential impacts to the prairie falcon may occur with the implementation of this segment. Prairie falcon preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat of cliffs or rocky outcrops, open arid valleys and agricultural fields in comparison to Variation D, due to it encompassing a smaller area.

4.4.15.5.4. Main E/Variation E

Potential habitat for the prairie falcon occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to prairie falcon foraging and nesting habitat if implemented.

4.4.15.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the prairie falcon, and with the implementation of these options, impacts to the prairie falcon may occur. However, with the above mentioned avoidance and minimization measures, impacts to the prairie falcon are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.15.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for prairie falcon will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.15.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.16. Yellow-breasted chat (*Icteria virens*): Federal Status-none; State Status-SSC

4.4.16.1. SURVEY RESULTS

No individuals of this species were noted within the BSA during site visits. However, suitable habitat for this species is present and this species could occur on the project site in the future during construction phase.

4.4.16.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.16.3. PROJECT IMPACTS

The implementation of the proposed project has the potential to impact this species during the construction phase of this project. Because this species has the ability to fly away, direct impacts to individual adults are not expected during the construction phase of this project. Potential exists for impacts to nesting birds should they be present. With the implementation of the above stated avoidance and minimization measures, impacts to this species will be minimized.

4.4.16.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.16.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the yellow-breasted chat have the potential to occur. Yellow-breasted chat foraging and nesting habitat occurs throughout the proposed project corridor within dense second-growth, riparian thickets and brush. Impacts to this species are expected to occur due to

construction activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.16.4.2. Main A/Variation A

Potential impacts to the yellow-breasted chat may occur with the implementation of this segment. Yellow-breasted chat preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main A would require fewer acres of permanent and temporary impacts to yellow-breasted chat preferred foraging and nesting habitat of dense second-growth, riparian thickets and brush, when compared to the Variation A.

4.4.16.4.3. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the yellow-breasted chat, and with the implementation of this variation impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to yellow-breasted chat are expected to be low. Main B has the potential to have impacts on yellow-breasted chat habitat to a lesser extent than Variation B1 and Variation B, as this option traverses less space than these variations and at one location, bisects farmland which not considered suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to yellow-breasted chat preferred foraging and nesting habitat within dense second-growth, riparian thickets and brush in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.16.4.4. Main D/Variation D

Potential impacts to the yellow-breasted chat may occur with the implementation of this segment. Yellow-breasted chat preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat within dense second-growth, riparian thickets and brush in comparison to Variation D, due to it encompassing a smaller area.

4.4.16.4.5. Main E/Variation E

Potential habitat for the yellow-breasted chat occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for

implementation in comparison to Variation E, therefore it will have less of an impact to yellow-breasted chat foraging and nesting habitat if implemented.

4.4.16.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.16.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the yellow-breasted chat have the potential to occur. Yellow-breasted chat foraging and nesting habitat occurs throughout the proposed project corridor within dense second-growth, riparian thickets and brush. Impacts to this species are expected to occur due to construction activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.16.5.2. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the yellow-breasted chat, and with the implementation of this variation impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to yellow-breasted chat are expected to be low. Main B has the potential to have impacts on yellow-breasted chat habitat to a lesser extent than Variation B1 and Variation B, as this option traverses less space than these variations and at one location, bisects farmland which not considered suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to yellow-breasted chat preferred foraging and nesting habitat within dense second-growth, riparian thickets and brush in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.16.5.3. Main D/Variation D

Potential impacts to the yellow-breasted chat may occur with the implementation of this segment. Yellow-breasted chat preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor.

Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat within dense second-growth, riparian thickets and brush in comparison to Variation D, due to it encompassing a smaller area.

4.4.16.5.4. Main E/Variation E

Potential habitat for the yellow-breasted chat occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to yellow-breasted chat foraging and nesting habitat if implemented.

4.4.16.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the yellow-breasted chat, and with the implementation of these options, impacts to the yellow-breasted chat may occur. However, with the above mentioned avoidance and minimization measures, impacts to the yellow-breasted chat are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.16.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for yellow-breasted chat will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.16.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.17. Loggerhead shrike (*Lanius ludovicianus*): Federal Status-none; State Status-SSC

4.4.17.1. SURVEY RESULTS

Suitable habitat for this species is present and individuals were observed within the limits of the project on site visits.

4.4.17.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.17.3. PROJECT IMPACTS

The implementation of the proposed project has the potential to impact this species during the construction phase of this project. Because this species has the ability to fly away, direct impacts to individual adults are not expected during the construction phase of this project. Potential exists for impacts to nesting birds should they be present. With the implementation of the above stated avoidance and minimization measures, impacts to this species will be minimized.

4.4.17.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.17.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the loggerhead shrike have the potential to occur. Loggerhead shrike foraging and nesting habitat occurs throughout the proposed project corridor within semi-open areas, with nesting occurring in trees and shrubs. Impacts to this species are expected to occur due to construction activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.17.4.2. Main A/Variation A

Potential impacts to the loggerhead shrike may occur with the implementation of this segment. Loggerhead shrike preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be

low. Main A would require fewer acres of permanent and temporary impacts to loggerhead shrike preferred foraging and nesting habitat of semi-open areas, with nesting occurring in trees and shrubs, when compared to the Variation A.

4.4.17.4.3. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the loggerhead shrike, and with the implementation of this segment, impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to loggerhead shrike are expected to be low. Main B has the potential to have impacts on loggerhead shrike habitat to a lesser extent than Variation B1 and Variation B, as this option traverses less space than these variations and at one location, bisects farmland which not considered suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to loggerhead shrike preferred foraging and nesting habitat within semi-open areas, with nesting occurring in trees and shrubs, in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.17.4.4. Main D/Variation D

Potential impacts to the loggerhead shrike may occur with the implementation of this segment. Loggerhead shrike preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat within semi-open areas, with nesting occurring in trees and shrubs, in comparison to Variation D, due to encompassing a smaller area.

4.4.17.4.5. Main E/Variation E

Potential habitat for the loggerhead shrike occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to loggerhead shrike foraging and nesting habitat if implemented.

4.4.17.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment

would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.17.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the loggerhead shrike have the potential to occur. Loggerhead shrike foraging and nesting habitat occurs throughout the proposed project corridor within semi-open areas, with nesting occurring in trees and shrubs. Impacts to this species are expected to occur due to construction activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.17.5.2. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the loggerhead shrike, and with the implementation of this segment, impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to loggerhead shrike are expected to be low. Main B has the potential to have impacts on loggerhead shrike habitat to a lesser extent than Variation B1 and Variation B, as this option traverses less space than these variations and at one location, bisects farmland which not considered suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to loggerhead shrike preferred foraging and nesting habitat within semi-open areas, with nesting occurring in trees and shrubs, in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.17.5.3. Main D/Variation D

Potential impacts to the loggerhead shrike may occur with the implementation of this segment. Loggerhead shrike preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat within semi-open areas, with nesting occurring in trees and shrubs, in comparison to Variation D, due to encompassing a smaller area.

4.4.17.5.4. Main E/Variation E

Potential habitat for the loggerhead shrike occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to loggerhead shrike foraging and nesting habitat if implemented.

4.4.17.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the loggerhead shrike, and with the implementation of these options, impacts to the loggerhead shrike may occur. However, with the above mentioned avoidance and minimization measures, impacts to the loggerhead shrike are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.17.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for loggerhead shrike will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.17.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.18. Summer tanager (*Piranga rubra*): Federal Status-none; State Status-SSC

4.4.18.1. SURVEY RESULTS

No individuals of this species were noted within the BSA during site visits. However, suitable habitat for this species is present and this species could occur on the project site in the future during construction phase.

4.4.18.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.18.3. PROJECT IMPACTS

The implementation of the proposed project has the potential to impact this species during the construction phase of this project. Because this species has the ability to fly away, direct impacts to individual adults are not expected during the construction phase of this project. Potential exists for impacts to nesting birds should they be present. With the implementation of the above stated avoidance and minimization measures, impacts to this species will be minimized.

This species is a riparian obligate species along streams among willows, cottonwoods, mesquite, or saltcedar dominated riparian habitats. Since only Main E and Variation E contain this type of habitat, others are eliminated from discussion. Variations E- Main, Variation E Highway Only and Variation E with Rail ExpressWest Connection are discussed below.

4.4.18.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.18.4.1. Main E/Variation E

Potential habitat for the summer tanager occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation within the Mojave River in comparison to Variation E, therefore it will have less of an impact to summer tanager foraging and nesting habitat if implemented.

4.4.18.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5.

4.4.18.5.1. Main E/Variation E

Potential habitat for the summer tanager occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation within the Mojave River in comparison to Variation E, therefore it will have less of an impact to summer tanager foraging and nesting habitat if implemented.

4.4.18.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for summer tanager will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.18.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.19. Le Conte's thrasher (*Toxostoma lecontei*): Federal Status-none; State Status-SSC

No individuals of this species were noted within the BSA during site visits. However, suitable habitat for this species is present and this species could occur on the project site in the future during construction phase.

4.4.19.1. SURVEY RESULTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 3: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.19.2. AVOIDANCE AND MINIMIZATION EFFORTS

The implementation of the proposed project has the potential to impact this species during the construction phase of this project. Because this species has the ability to fly away, direct impacts to individual adults are not expected during the construction

phase of this project. Potential exists for impacts to nesting birds should they be present. With the implementation of the above stated avoidance and minimization measures, impacts to this species will be minimized.

4.4.19.3. PROJECT IMPACTS

The implementation of the proposed project has the potential to impact this species during the construction phase of this project. Because this species has the ability to fly away, direct impacts to individual adults are not expected during the construction phase of this project. Potential exists for impacts to nesting birds should they be present. With the implementation of the above stated avoidance and minimization measures, impacts to this species will be minimized.

4.4.19.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.19.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the Le Conte's thrasher have the potential to occur. Le Conte's thrasher foraging and nesting habitat occurs throughout the proposed project corridor within sparsely vegetated desert flats, dunes, alluvial fans, or gently rolling hills having a high proportion of saltbush (*Atriplex spp.*) or cholla (cylindrical *Opuntia spps.*). Impacts to this species are expected to occur due to construction activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.19.4.2. Main A/Variation A

Potential impacts to the Le Conte's thrasher may occur with the implementation of this segment. Le Conte's thrasher preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main A would require fewer acres of permanent and temporary impacts to Le Conte's thrasher preferred foraging and nesting habitat of sparsely vegetated desert flats, dunes, alluvial fans, or gently rolling hills having a high proportion of saltbush (*Atriplex spp.*) or cholla (cylindrical *Opuntia spps.*), when compared to the Variation A.

4.4.19.4.3. Main B/Variation B/Variation B1

Main B includes areas that are potential habitat to the Le Conte's thrasher, and with the implementation of this segment, impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to Le Conte's thrasher are expected to be low. Main B has the potential to have impacts on Le Conte's thrasher habitat to a lesser extent than Variation B1 and Variation B, as this option traverses less space than these variations and at one location, bisects farmland which not considered suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to Le Conte's thrasher preferred foraging and nesting habitat within sparsely vegetated desert flats, dunes, alluvial fans, or gently rolling hills having a high proportion of saltbush (*Atriplex spp.*) or cholla (cylindrical *Opuntia spps.*), in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.19.4.4. Main D/Variation D

Potential impacts to the Le Conte's thrasher may occur with the implementation of this segment. Le Conte's thrasher preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat within sparsely vegetated desert flats, dunes, alluvial fans, or gently rolling hills having a high proportion of saltbush (*Atriplex spp.*) or cholla (cylindrical *Opuntia spps.*), in comparison to Variation D, due to encompassing a smaller area.

4.4.19.4.5. Main E/Variation E

Potential habitat for the Le Conte's thrasher occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to Le Conte's thrasher foraging and nesting habitat if implemented.

4.4.19.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment

would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.19.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to the Le Conte's thrasher have the potential to occur. Le Conte's thrasher foraging and nesting habitat occurs throughout the proposed project corridor within sparsely vegetated desert flats, dunes, alluvial fans, or gently rolling hills having a high proportion of saltbush (*Atriplex spp.*) or cholla (cylindrical *Opuntia spps.*). Impacts to this species are expected to occur due to construction activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.19.5.2. Main B/Variation B/Variation B1

Main B includes areas that are potential habitat to the Le Conte's thrasher, and with the implementation of this segment, impacts to this species may occur. However, with the above mentioned avoidance and minimization measures, impacts to Le Conte's thrasher are expected to be low. Main B has the potential to have impacts on Le Conte's thrasher habitat to a lesser extent than Variation B1 and Variation B, as this option traverses less space than these variations and at one location, bisects farmland which not considered suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to Le Conte's thrasher preferred foraging and nesting habitat within sparsely vegetated desert flats, dunes, alluvial fans, or gently rolling hills having a high proportion of saltbush (*Atriplex spp.*) or cholla (cylindrical *Opuntia spps.*), in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.19.5.3. Main D/Variation D

Potential impacts to the Le Conte's thrasher may occur with the implementation of this segment. Le Conte's thrasher preferred foraging and nesting habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to foraging and nesting habitat within sparsely vegetated desert flats, dunes, alluvial fans, or gently rolling hills having a high proportion of saltbush (*Atriplex spp.*) or cholla (cylindrical *Opuntia spps.*), in comparison to Variation D, due to encompassing a smaller area.

4.4.19.5.4. Main E/Variation E

Potential habitat for the Le Conte's thrasher occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to Le Conte's thrasher foraging and nesting habitat if implemented.

4.4.19.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the Le Conte's thrasher, and with the implementation of these options, impacts to the Le Conte's thrasher may occur. However, with the above mentioned avoidance and minimization measures, impacts to the Le Conte's thrasher are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.19.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for Le Conte's thrasher will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.19.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.20. Least Bell's vireo (*Vireo bellii pusillus*): Federal Status-Endangered; State Status-Endangered

4.4.20.1. SURVEY RESULTS

Several individuals displaying nesting behavior were observed within the BSA in specific areas along the Mojave River. Surveys conducted where Main E intersects with the Mojave River has yielded no observations of individuals or nesting behavior of this species. Individuals and nesting behavior has only been observed in the area where the Variation E of the Freeway/Expressway (Freeway/Tollway) with HSR rail line intersects the Mojave River.

4.4.20.2. AVOIDANCE AND MINIMIZATION EFFORTS

The main alignment alternative would completely avoid and minimize impacts to this species in addition to all other Variations with the exception of Variation E of the Freeway/Expressway (Freeway/Tollway) with HSR Alternative.

Should the Variation E of the Freeway/Expressway (Freeway/Tollway) with HSR Alternative be chosen as the preferred alternative, the following avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.20.3. PROJECT IMPACTS

This species is a riparian obligate species along streams among willow-, aspen-, and sycamore-dominated riparian habitats. Since only Variation E Main and Variation E contain such habitats, other alignments are eliminated from discussion. Variation E Main and Variation E of the Freeway/Expressway (Freeway/Tollway) Alternative and the Freeway/Expressway(Freeway/Tollway) with HSR Alternatives are discussed. With the implementation of BTE-4 through 10 from the Biological Opinion impacts to this species would be reduced.

4.4.20.3.1. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact. Table 11 contains the amount of occupied habitat per species within each Variation of this Alternative for which the acreages stated below are derived from.

4.4.20.3.1.1. Main E

Based on the four years of focused surveys for this species, observations indicate the reach of the Mojave River that intersects with the Variation Main E does not

support this specie; therefore, this Variation is not occupied habitat. Least Bell's vireo was not detected within 1,000 feet of Main E. Spanning the Mojave River with a bridge following the Variation E Main would have low impacts to potentially suitable habitat.

The riparian vegetation where the project would cross the Mojave River is of poor quality in terms of supporting the willow-dominated area that comprises least Bell's vireo habitat; therefore, impacts to this species are not anticipated.

Permanent and temporary habitat loss for least Bell's vireo would occur as a result of construction activities; however, it would not occur in all riparian habitats within the project. In general, riparian habitat within 1,000 feet upstream and downstream (identified as action area in BA) is very poor and does not contain the appropriate nesting requirements (e.g., dense vegetative cover and structural diversity) for least Bell's vireo. Under Main E, permanent and temporary habitat loss would occur in the stretch of riparian vegetation west of Gas Line Road, approximately one mile west of the Mojave River. Temporary impacts would occur to 0.13 acre of Fremont cottonwood forest alliance and permanent impacts would occur to 1.63 acres of Fremont cottonwood forest. The Fremont cottonwood forest alliance at this location does not provide suitable habitat for this species because it is small in size, has a sparsely vegetated understory, and the cottonwood trees are unhealthy; therefore, it is anticipated that this habitat removal would not have a direct effect to this species.

Because this species shares similar habitat types to southwestern willow flycatcher, direct and indirect impacts to this species for this Variation are similar to what is stated in the southwestern willow flycatcher section. These direct and indirect impacts are not expected to affect least Bell's vireo based on the lack of suitable nesting habitat and the distance from the alignment to the closest observed nest.

The USFWS has issued a Biological Opinion (April 2016) for least Bell's vireo on Variation E Main Freeway/Expressway and Freeway/Tollway Alternatives with HSR Feeder Service. The determination is that the project may affect, but is not likely to adversely affect. The project is not likely to adversely affect these biological resources because of low- quality existing habitat within the action area, project design, and the many project measures implemented to protect these resources.

4.4.20.3.1.2. Variation E

Based on the four years of focused surveys for this species, observations indicate the reach of the Mojave River that intersects with the Variation E does not support this species, therefore this Variation is not occupied habitat. Because of the proximity to Variation E Main, impacts to habitat quality and suitability are similar.

Direct and indirect impacts to this species for this Variation are similar to what is stated above.

4.4.20.3.2. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE WITH HSR ALTERNATIVES

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact. Table 12 and 13 contains the amount of occupied habitat per species within each Variation of this Alternative for which the acreages stated below are derived from.

4.4.20.3.2.1. Main E

Because of the proximity to Main E Highway only Alternative, impacts to habitat quality and suitability are similar. Based on the four years of focused surveys for least Bell's vireo, observations indicate the reach of the Mojave River that intersects with the Main E does not support this species, therefore this Variation is not occupied habitat. Spanning the Mojave River with a bridge following the Main E would have low impacts to potentially suitable habitat.

The riparian vegetation where the project would cross the Mojave River is of poor quality in terms of supporting a willow-dominated riparian area that comprises suitable habitat; therefore, impacts to suitable habitat would be low.

The BA (August 2015), which only accounted for impacts to the Preferred Alternative (Main E, Highway and High Speed Rail), state that a total of 4.19 acres of low quality riparian habitat occur within critical habitat, of which 0.88 acre would not be affected; 3.24 acres would be permanently impacted; and 0.07 acre would be temporarily affected. However, this alignment underwent minor engineering revisions in November 2015, and the impacts have been slightly reduced. Currently, 0.72 acre would not be affected (bridge over Mojave River); 3.17 acres would be permanently impacted; and 0.11 acre would be temporarily affected, making a total of 4.00 acres of low quality riparian habitat within the Main E Freeway/Expressway and Freeway/Tollway Alternatives with HSR Feeder Service. This habitat does not contain the physical and biological features necessary to support this species.

Direct and indirect impacts to this species for this Variation are similar to what is stated above. With this Variation, approximately 0.07 acre of Fremont Cottonwood forest Alliance and 0.04 acre of sandbar willow thickets would be temporarily impacted, while permanent impacts to approximately 3.17 acres of Fremont Cottonwood forest Alliance would occur.

4.4.20.3.2.2. Variation E

Based on the four years of focused surveys for this species, observations indicate the reach of the Mojave River that intersects with the Variation E does support this species, therefore this Variation is considered occupied habitat. Several individuals and nesting territories of least Bell's vireo were observed within 1,000 feet of this Variation, therefore direct and indirect impacts have the potential to occur. With this Variation, the highway and High Speed Rail are split by about 2,500 feet. The Highway portion is adjacent to the Variation E Main and Variation E associated with the Highway only Alternative, which is considered unoccupied and low-quality habitat for this species. Because of this, the occupied portion of this Variation was determined by the records of the species within 1,000 feet of the project boundaries. Although there are a total of 4.77 acres of potentially suitable habitat that could be permanently or temporarily impacted as a result of this Variation, based on the results of surveys it was determined that 1.86 acres of occupied habitat would be permanently impacted as a result of implementation of this Variation.

Spanning this reach of the river with a bridge would impact the quality of habitat reducing it by the shadowing effect, which would likely negatively affect the quality of habitat to a point where nesting of these species may not occur. This determination is different than the other Alternative analysis further downstream because the vegetation is sparse and is not considered suitable habitat for the species. The vegetation associated with this Variation is dense riparian vegetation that would be affected as a result of a bridge. Additionally, this area would suffer from a negative effect from increased litter and vagrancy, as this is typical of bridge structures over rivers. Therefore, there is potential for the rail line associated with Variation E to have substantial impact to nesting habitat of this species. There would be 1.86 acres of permanent impacts to occupied least Bell's vireo habitat with Variation E implementation.

Direct impacts to this species would include direct removal of suitable habitat and potential train car collisions with individuals.

Indirect impacts from noise, vibration, increased human activity and visual disturbance, and light disturbance could also occur as a result of the project.

4.4.20.4. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for least Bell's vireo will incidentally be preserved.

4.4.20.5. CUMULATIVE EFFECTS

Cumulative effects are not expected to occur since there will be no impacts to this species unless Variation E of the Freeway/Expressway (Freeway/Tollway) with HSR is implemented.

Should Variation E of the Freeway/Expressway (Freeway/Tollway) with HSR line be the preferred option, this project may have a substantial impact on this species. Although no other projects have impacts to the Mojave River and this species, the small size of this area in comparison to the desert region makes the impact high in it of itself, and therefore contributes to a cumulative effect on this species.

4.4.21. Yellow Warbler (*Setophaga petechia*): Federal Status-none; State Status-SSC

4.4.21.1. SURVEY RESULTS

No individuals of this species were noted within the BSA during site visits. However, suitable habitat for this species is present and this species could occur on the project site in the future during construction phase.

4.4.21.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 2 (AMM-2) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.21.3. PROJECT IMPACTS

The implementation of the proposed project has the potential to impact this species during the construction phase of this project. Because this species has the ability to fly away, direct impacts to individual adults are not expected during the construction phase of this project. Potential exists for impacts to nesting birds should they be present. With the implementation of the above stated avoidance and minimization measures, impacts to this species will be minimized.

This species is a riparian obligate species along streams among willow, aspen and sycamore dominated riparian habitats. Since only a few alternatives contain this type of habitat, others are eliminated from discussion. Main E and Variation E of both alternatives are discussed below.

4.4.21.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts

to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.21.4.1. Main E/Variation E

Potential habitat for the yellow warbler occurs within the potential impact area of this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main requires fewer acres for implementation within the Mojave River in comparison to Variation E, therefore it will have less of an impact to yellow warbler foraging and nesting habitat if implemented.

4.4.21.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5.

4.4.21.5.1. Main E/Variation E

Potential habitat for the yellow warbler occurs within the potential impact area of this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main requires fewer acres for implementation within the Mojave River in comparison to Variation E, therefore it will have less of an impact to yellow warbler foraging and nesting habitat if implemented.

4.4.21.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for yellow warbler will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.21.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to

all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.22. Townsend's big-eared bat (*Corynorhinus townsendii*): Federal Status-none; State Status-Candidate Threatened/SSC; BLM-Sensitive; USFS: Sensitive

4.4.22.1. SURVEY RESULTS

No individuals of this species were noted within the BSA during site visits. However, suitable habitat for this species is present and this species could occur on the project site in the future during construction phase. The areas surveyed and a description of survey methodology can be viewed in the Consolidated Bat Survey Report, Appendix N

4.4.22.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 3 (AMM-3) and 4 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.22.3. PROJECT IMPACTS

Although focused detection surveys were conducted for this species and they were not detected, not all areas of suitable habitat were able to be surveyed. In addition, suitable habitat (abandoned buildings) are likely to become more abundant prior to construction because if the building is within the footprint of the project, it will be demolished. There were many buildings in the BSA at the time of surveys that were currently occupied by humans or were on private property for which surveyors did not have access. Implementation of the proposed project has the potential to impact this species during the construction phase. Because this species has the ability to fly away, direct impacts to individual adults are not expected. Potential exists for impacts to dependent juveniles, should they be present. With implementation of BTE-44 impacts to this species will be reduced.

4.4.22.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features only a highway, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative; therefore, impacts to habitat for this species would occur to a lesser extent because of the reduced area of impact. Within nearly all Variations in both Alternatives, impacts to Townsend's big-eared bat habitat have the potential to occur. Townsend's big-eared bat habitat occurs throughout the proposed project within dry desert washes, floodplains, and grasslands. Impacts to roosting and foraging habitat of this sp ecies are expected to

occur due to clearing and grubbing activities associated with implementation of the proposed project. With incorporation of minimization measures, impacts to individuals of this species are expected to be low.

4.4.22.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to Townsend's big-eared bat have the potential to occur. Townsend's big-eared bat habitat occurs throughout the proposed project corridor, within dry desert washes, flood plains, grasslands, and abandoned buildings. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. Through implementation of avoidance and minimization measures, impacts would be reduced.

4.4.22.4.2. Main A/Variation A

Potential impacts to the Townsend's big-eared bat may occur with the implementation of this segment. The Townsend's big-eared bat's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low.

Main A would require less acres of permanent and temporary impacts, when compared to the Variation A, as it traverses less distance along existing roadways.

4.4.22.4.3. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the Townsend's big-eared bat, and with the implementation of this segment, impacts to the Townsend's big-eared bat may occur. However, with the above mentioned avoidance and minimization measures, impacts to Townsend's big-eared bat are expected to be low.

Variation B1 has the potential to have impact on Townsend's big-eared bat habitat to a lesser extent than Main B and Variation B, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Main B and Variation B require considerably more acres of temporary and permanent impacts to suitable foraging habitatin comparison to Variation B1, due to its alignment encompassing a greater area.

4.4.22.4.4. Main D/Variation D

Potential impacts to the Townsend's big-eared bat may occur with the implementation of this segment. The Townsend's big-eared bat's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor.

4.4.22.4.5. Main E/Variation E

Potential habitat for the Townsend's big-eared bat occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low.

Variation E requires fewer acres for implementation in comparison to Main E, therefore it will have less of an impact to Townsend's big-eared bat habitat if implemented.

4.4.22.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species. Table 12 and 13 contains the amount of occupied habitat per species within each Variation of this Alternative for which the acreages stated below are derived from.

4.4.22.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to Townsend's big-eared bat have the potential to occur. Townsend's big-eared bat habitat occurs throughout the proposed project corridor, within dry desert washes and desert scrubland. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. Through implementation of avoidance and minimization measures, impacts would be reduced.

4.4.22.5.2. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the Townsend's big-eared bat, and with the implementation of this segment, impacts to the Townsend's big-

eared bat may occur. However, with the above mentioned avoidance and minimization measures, impacts to Townsend's big-eared bat are expected to be low.

Variation B1 has the potential to have impact on Townsend's big-eared bat habitat to a lesser extent than Main B and Variation B, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Main B and Variation B requires considerably more acres of temporary and permanent impact to dry desert washes and desert scrubland, in comparison to Main B and Variation B, due to its alignment encompassing a greater area.

4.4.22.5.3. Main D/Variation D

Potential impacts to the Townsend's big-eared bat may occur with the implementation of this segment. The Townsend's big-eared bat's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor.

Main D would require fewer acres of permanent and temporary impacts to dry desert washes and desert scrubland, in comparison to Variation D, due to encompassing a smaller area.

4.4.22.5.4. Main E/Variation E

Potential habitat for the Townsend's big-eared bat occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low.

Main E requires fewer acres to be permanently impacted for implementation in comparison to Variation E, therefore it will have less of an impact to Townsend's big-eared bat habitat if implemented.

4.4.22.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the Townsend's big-eared bat, and with the implementation of these options, impacts to the Townsend's big-eared bat may occur. However, with the above mentioned avoidance and minimization measures, impacts to Townsend's big-eared bat are expected to be low.

Rail Option 1A

Through implementation of avoidance and minimization measures, impacts would be reduced.

Rail Option 1B

Through implementation of avoidance and minimization measures, impacts would be reduced.

Rail Option 1C

Through implementation of avoidance and minimization measures, impacts would be reduced.

Rail Option 7A

Through implementation of avoidance and minimization measures, impacts would be reduced.

Rail Option 7B

Through implementation of avoidance and minimization measures, impacts would be reduced.

Rail Option 7C

Approximately 69.03 acres of roosting and foraging habitat occurs within this segment.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.22.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for Townsend's big-eared bat will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.22.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.23. Western mastiff bat (*Eumops perotis californicus*): Federal Status-none; State Status-SSC; BLM-Sensitive

4.4.23.1. SURVEY RESULTS

No individuals of this species were noted within the BSA during site visits. However, suitable habitat for this species is present and this species could occur on the project site in the future during construction phase.

4.4.23.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 3 (AMM-2) and 5 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.23.3. PROJECT IMPACTS

The implementation of the proposed project has the potential to impact this species during the construction phase of this project. Because this species has the ability to fly away, direct impacts to individual adults are not expected during the construction phase of this project. Potential exists for impacts to dependent juveniles should they be present. With the implementation of the above stated avoidance and minimization measures, impacts to this species will be minimized.

4.4.23.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.23.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to western mastiff bat have the potential to occur. Western mastiff bat habitat occurs throughout the proposed project corridor, within dry desert washes and deserc scrubland. Impacts to this species are expected to occur due to clearing and grubbing activities associated

with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.23.4.2. Main A/Variation A

Potential impacts to the western mastiff bat may occur with the implementation of this segment. The western mastiff bat's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main A would require less acres of permanent and temporary impacts dry desert washes and desert scrubland, when compared to the Variation A, as it traverses less distance along existing roadways.

4.4.23.4.3. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the western mastiff bat, and with the implementation of this segment, impacts to the western mastiff bat may occur. However, with the above mentioned avoidance and minimization measures, impacts to western mastiff bat are expected to be low. Main B has the potential to have impact on western mastiff bat habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact dry desert washes and desert scrubland, in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.23.4.4. Main D/Variation D

Potential impacts to the western mastiff bat may occur with the implementation of this segment. The western mastiff bat's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to dry desert washes and desert scrubland, in comparison to Variation D, due to encompassing a smaller area.

4.4.23.4.5. Main E/Variation E

Potential habitat for the western mastiff bat occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to western mastiff bat habitat if implemented.

4.4.23.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.23.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to western mastiff bat have the potential to occur. Western mastiff bat habitat occurs throughout the proposed project corridor, within dry desert washes and desert scrubland. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.23.5.2. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the western mastiff bat, and with the implementation of this segment, impacts to the western mastiff bat may occur. However, with the above mentioned avoidance and minimization measures, impacts to western mastiff bat are expected to be low. Main B has the potential to have impact on western mastiff bat habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact dry desert washes and desert scrubland, in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.23.5.3. Main D/Variation D

Potential impacts to the western mastiff bat may occur with the implementation of this segment. The western mastiff bat's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to dry desert washes and desert scrubland, in comparison to Variation D, due to encompassing a smaller area.

4.4.23.5.4. Main E/Variation E

Potential habitat for the western mastiff bat occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to western mastiff bat habitat if implemented.

4.4.23.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the western mastiff bat, and with the implementation of these options, impacts to the western mastiff bat may occur. However, with the above mentioned avoidance and minimization measures, impacts to western mastiff bat are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.23.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for western mastiff bat will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.23.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.24. Yuma myotis (*Myotis yumanensis*): Federal Status-none; State Status-none; BLM-Sensitive; WBWG-LM

4.4.24.1. SURVEY RESULTS

No individuals of this species were noted within the BSA during site visits. However, suitable habitat for this species is present and this species could occur on the project site in the future during construction phase.

4.4.24.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measures 3 (AMM-2) and 5 (AMM-4), listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.24.3. PROJECT IMPACTS

The implementation of the proposed project has the potential to impact this species during the construction phase of this project. Because this species has the ability to fly away, direct impacts to individual adults are not expected during the construction phase of this project. Potential exists for impacts to dependent juveniles should they be present. With the implementation of the above stated avoidance and minimization measures, impacts to this species will be minimized.

4.4.24.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.24.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to yuma myotis have the potential to occur. Yuma myotis habitat occurs throughout the proposed project corridor, within mines, caves, buildings or bridges. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.24.4.2. Main A/Variation A

Potential impacts to the yuma myotis may occur with the implementation of this segment. The yuma myotis's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures

mentioned above, impacts to this species are expected to be low. Main A would require less acres of permanent and temporary impacts to mines, caves, buildings or bridges, when compared to the Variation A, as it traverses less distance along existing roadways.

4.4.24.4.3. Main B/Variation B/Variation B1

Main B includes areas that are potential habitat to the yuma myotis, and with the implementation of this variation impacts to the yuma myotis may occur. However, with the above mentioned avoidance and minimization measures, impacts to yuma myotis are expected to be low. Main B has the potential to have impact on yuma myotis habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to mines, caves, buildings or bridges, in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.24.4.4. Main D/Variation D

Potential impacts to the yuma myotis may occur with the implementation of this segment. The yuma myotis's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to mines, caves, buildings or bridges, in comparison to Variation D, due to the shorter distance along an existing roadway.

4.4.24.4.5. Main E/Variation E

Potential habitat for the yuma myotis occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to yuma myotis habitat if implemented.

4.4.24.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment

would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.24.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to yuma myotis have the potential to occur. Yuma myotis habitat occurs throughout the proposed project corridor, within mines, caves, buildings or bridges. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.24.5.2. Main B/Variation B/Variation B1

Main B includes areas that are potential habitat to the yuma myotis, and with the implementation of this variation impacts to the yuma myotis may occur. However, with the above mentioned avoidance and minimization measures, impacts to yuma myotis are expected to be low. Main B has the potential to have impact on yuma myotis habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to mines, caves, buildings or bridges, in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.24.5.3. Main D/Variation D

Potential impacts to the yuma myotis may occur with the implementation of this segment. The yuma myotis's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to mines, caves, buildings or bridges, in comparison to Variation D, due to the shorter distance along an existing roadway.

4.4.24.5.4. Main E/Variation E

Potential habitat for the yuma myotis occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to yuma myotis habitat if implemented.

4.4.24.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the yuma myotis, and with the implementation of these options, impacts to the yuma myotis may occur. However, with the above mentioned avoidance and minimization measures, impacts to yuma myotis are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.24.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. With this, habitat suitable for Yuma myotis will incidentally be preserved. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.24.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.25. Mojave river vole (*Microtus californicus mohavensis*): Federal Status-none; State Status-SSC

4.4.25.1. SURVEY RESULTS

No sign or observations of individuals was recorded during surveys or site visits. However, suitable habitat for this species occurs within the BSA.

4.4.25.2. AVOIDANCE AND MINIMIZATION EFFORTS

Because this species has the potential for occurring during the construction phase, avoidance and minimization measure 5 (AMM-5) listed in Table 6: Avoidance and Minimization/Mitigation Measures, should be implemented.

4.4.25.3. PROJECT IMPACTS

Because the habitat on the project site appears similar to those of the surrounding area, it is expected that impacts to this species would be no greater in the number of individuals are expected to be taken in any one area within the BSA.

Impacts to this species can be minimized, to some extent, by requiring a biological monitor to be present on site during initial clearing and grubbing activity to capture and relocate any individuals.

Habitat for this species can be re-established within temporary impact zones between the highway and edge of R.O.W. This area should be replanted with native plants similar to the natural surrounding area and the soil compacted only to a point necessary for construction purposes. This will allow any natural occurring individuals within the immediate vicinity to re-populate the temporary impact zone.

This species is a riparian obligate species primarily within weedy herbaceous dominated riparian habitats near the Mojave River. Since only a Main E and Variation E of the alternatives contain this type of habitat, others are eliminated from discussion. Main E and Variation E of the alternatives are discussed below.

4.4.25.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.25.4.1. Main E/Variation E

Potential habitat for the Mojave river vole occurs within the potential impact area of Main E, and if implemented this variation could have an impact to Mojave river vole individuals. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E-, therefore it will have less of an impact to Mojave river vole foraging and nesting habitat within the Mojave River if implemented.

4.4.25.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5.

4.4.25.5.1. Main E/Variation E

Potential habitat for the Mojave river vole occurs within the potential impact area of Main E, and if implemented this variation could have an impact to Mojave river vole individuals. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E-, therefore it will have less of an impact to Mojave river vole foraging and nesting habitat within the Mojave River if implemented.

4.4.25.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity.

Mitigation Measures 1-4 (MM 1-4) as seen in Table 6: Avoidance and Minimization/Mitigation Measures shall be implemented.

4.4.25.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.26. San Diego Desert Woodrat (*Neotoma lepida intermedia*): Federal Status-none; State Status-SSC

4.4.26.1. SURVEY RESULTS

This species was observed during site visits. Individuals and sign of this species was observed during site visits. It is expected to occur in relatively normal numbers throughout the BSA when compared to similar habitat in the vicinity.

4.4.26.2. AVOIDANCE AND MINIMIZATION EFFORTS

The habitat for this species noted within the BSA appears similar to other areas within the region, therefore there is no evidence to suggest there would be a greater density of this species found within the BSA. It is expected that the number of individuals found will be equal to those of the surrounding area. As such, avoidance and minimization measures AMM-1, and AMM-5 shall be implemented for this species.

4.4.26.3. PROJECT IMPACTS

As noted above, this species occurs within the BSA. Because of the nature and lifestyle of this species, it is expected that individuals will be taken during clearing and grubbing activities. Because the habitat on the project site appears similar to those of the surrounding area, it is expected that impacts to this species would be no greater in the number of individuals are expected to be taken in any one area within the project limits.

Impacts to this species can be minimized, to some extent, by requiring a biological monitor to be present on site during initial clearing and grubbing activity to capture and relocate any individuals.

Habitat for this species can be re-established within temporary impact zones between the highway and edge of R.O.W. This area should be replanted with native plants similar to the natural surrounding area and the soil compacted only to a point necessary for construction purposes. This will allow any natural occurring individuals within the immediate vicinity to re-populate the temporary impact zone.

4.4.26.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.26.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to San Diego desert woodrat have the potential to occur. San Diego desert woodrat habitat occurs throughout the proposed project corridor, within Joshua tree woodland, pinyon-juniper woodland, mixed and chamise-redshank chaparral, and sagebrush. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of

the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.26.4.2. Main A/Variation A

Potential impacts to the San Diego desert woodrat may occur with the implementation of this segment. The San Diego desert woodrat's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main A would require less acres of permanent and temporary impacts to Joshua tree woodland, pinyon-juniper woodland, mixed and chamise-redshank chaparral, and sagebrush, when compared to the Variation A, as it traverses less distance along existing roadways.

4.4.26.4.3. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the San Diego desert woodrat, and with the implementation of this segment impacts to the San Diego desert woodrat may occur. However, with the above mentioned avoidance and minimization measures, impacts to San Diego desert woodrat are expected to be low. Main B has the potential to have impacts on San Diego desert woodrat habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to Joshua tree woodland, pinyon-juniper woodland, mixed and chamise-redshank chaparral, and sagebrush, in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.26.4.4. Main D/Variation D

Potential impacts to the San Diego desert woodrat may occur with the implementation of this segment. The San Diego desert woodrat's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to Joshua tree woodland, pinyon-juniper woodland, mixed and chamise-redshank chaparral, and sagebrush, in comparison to Variation D, due to encompassing a smaller area.

4.4.26.4.5. Main E/Variation E

Potential habitat for the San Diego desert woodrat occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for

implementation in comparison to Variation E, therefore it will have less of an impact to San Diego desert woodrat habitat if implemented.

4.4.26.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.26.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to San Diego desert woodrat have the potential to occur. San Diego desert woodrat habitat occurs throughout the proposed project corridor, within Joshua tree woodland, pinyon-juniper woodland, mixed and chamise-redshank chaparral, and sagebrush. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.26.5.2. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the San Diego desert woodrat, and with the implementation of this segment impacts to the San Diego desert woodrat may occur. However, with the above mentioned avoidance and minimization measures, impacts to San Diego desert woodrat are expected to be low. Main B has the potential to have impacts on San Diego desert woodrat habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to Joshua tree woodland, pinyon-juniper woodland, mixed and chamise-redshank chaparral, and sagebrush, in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.26.5.3. Main D/Variation D

Potential impacts to the San Diego desert woodrat may occur with the implementation of this segment. The San Diego desert woodrat's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance

and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to Joshua tree woodland, pinyon-juniper woodland, mixed and chamise-redshank chaparral, and sagebrush, in comparison to Variation D, due to encompassing a smaller area.

4.4.26.5.4. Main E/Variation E

Potential habitat for the San Diego desert woodrat occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to San Diego desert woodrat habitat if implemented.

4.4.26.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the San Diego desert woodrat, and with the implementation of these options, impacts to the San Diego desert woodrat may occur. However, with the above mentioned avoidance and minimization measures, impacts to San Diego desert woodrat are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.26.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

Mitigation Measures 1-4 (MM 1-4) as seen in Table 6: Avoidance and Minimization/Mitigation Measures shall be implemented.

4.4.26.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region

the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.27. American Badger (*Taxidea taxus*): Federal Status-none; State Status-SSC

4.4.27.1. SURVEY RESULTS

Suitable habitat for this species is present and individuals have been observed within the BSA.

4.4.27.2. AVOIDANCE AND MINIMIZATION EFFORTS

The habitat for this species noted within the BSA appears similar to other areas within the region, therefore there is no evidence to suggest there would be a greater density of this species found within the BSA. It is expected that the number of individuals found will be equal to those of the surrounding area. As such, avoidance and minimization measures AMM-1, and AMM-5 shall be implemented for this species.

4.4.27.3. PROJECT IMPACTS

As noted above, this species occurs within the BSA. Because the habitat on the project site appears similar to those of the surrounding area, it is expected that impacts to this species would be no greater in the number of individuals are expected to be taken in any one area within the BSA.

Habitat for this species can be re-established within temporary impact zones between the highway and edge of R.O.W. This area should be replanted with native plants similar to the natural surrounding area and the soil compacted only to a point necessary for construction purposes. This will allow any natural occurring individuals within the immediate vicinity to re-populate the temporary impact zone.

4.4.27.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.27.4.1 Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to American badger have the potential to occur. American badger habitat occurs throughout the

proposed project corridor, within brushlands with little groundcover. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.27.4.2. Main A/Variation A

Potential impacts to the American badger may occur with the implementation of this segment. The American badger's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main A would require less acres of permanent and temporary impacts to Joshua tree woodland, pinyon-juniper woodland, mixed and chamise-redshank chaparral, and sagebrush, when compared to the Variation A, as it traverses less distance along existing roadways.

4.4.27.4.3. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the American badger, and with the implementation of this segment impacts to the American badger may occur. However, with the above mentioned avoidance and minimization measures, impacts to American badger are expected to be low. Main B has the potential to have impact on American badger habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to brushlands with little groundcover, in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.27.4.4. Main D/Variation D

Potential impacts to the American badger may occur with the implementation of this segment. The American badger's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to brushlands with little groundcover, in comparison to Variation D, due to encompassing a smaller area.

4.4.27.4.5. Main E/Variation E

Potential habitat for the American badger occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for

implementation in comparison to Variation, therefore it will have less of an impact to American badger habitat if implemented.

4.4.27.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative, and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.27.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to American badger have the potential to occur. American badger habitat occurs throughout the proposed project corridor, within brushlands with little groundcover. Impacts to this species are expected to occur due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.27.5.2. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the American badger, and with the implementation of this segment impacts to the American badger may occur. However, with the above mentioned avoidance and minimization measures, impacts to American badger are expected to be low. Main B has the potential to have impact on American badger habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to brushlands with little groundcover, in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.27.5.3. Main D/Variation D

Potential impacts to the American badger may occur with the implementation of this segment. The American badger's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require

fewer acres of permanent and temporary impacts to brushlands with little groundcover, in comparison to Variation D, due to encompassing a smaller area.

4.4.27.5.4. Main E/Variation E

Potential habitat for the American badger occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation, therefore it will have less of an impact to American badger habitat if implemented.

4.4.27.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the American badger, and with the implementation of these options, impacts to the American badger may occur. However, with the above mentioned avoidance and minimization measures, impacts to American badger are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.27.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity.

Mitigation Measures 1-4 (MM 1-4) as seen in Table 6: Avoidance and Minimization/Mitigation Measures shall be implemented to reduce impacts to this species. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.27.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to

all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

4.4.28. Mohave ground squirrel (*Xerospermophilus mohavensis*): Federal Status-none; State Status-Threatened

4.4.28.1. SURVEY RESULTS

Focused level surveys have been conducted in 2011, 2012, and 2013 and have yielded no observations of this species. However, suitable habitat for this species is present.

4.4.28.2. AVOIDANCE AND MINIMIZATION EFFORTS

Impacts to this species are not expected. Impacts to suitable habitat would be reduced with implementation of avoidance and minimization measure 5 (AMM-5) shall be implemented.

4.4.28.3. PROJECT IMPACTS

No impacts to this species are expected, due to the multiple focused trapping surveys that have not captured or had any incidental observations or detections of individuals. However, with the implementation of BAN-5 (HMMP), BNC-4, BAN-7, BTE-2, BTE-3, and BTE-11 (compensatory mitigation for for impacts to habitat for various sensitive plant and wildlife species), and BTE-31 (worker environmental awareness program) any impacts to suitable habitat would be reduced.

4.4.28.4. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) ALTERNATIVE

Because this alternative features a highway only, it is narrower in comparison to the Freeway/Expressway (Freeway/Tollway) with HSR Alternative, and therefore impacts to habitat for this species will occur to a lesser extent because of the reduced area of impact.

4.4.28.4.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to Mohave ground squirrel have the potential to occur. Mohave ground squirrel habitat occurs throughout the proposed project corridor, within brushlands with little groundcover. Impacts to this species are expected to be low due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.28.4.2. Main A/Variation A

Potential impacts to the Mohave ground squirrel may occur with the implementation of this segment. The Mohave ground squirrel's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species are expected to be low. Main A would require less acres of permanent and temporary impacts to Joshua tree woodland and desert scrubland, when compared to the Variation A, as it traverses less distance along existing roadways.

4.4.28.4.3. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the Mohave ground squirrel, and with the implementation of this segment, impacts to the Mohave ground squirrel may occur. However, with the above mentioned avoidance and minimization measures, impacts to Mohave ground squirrel are expected to be low. Main B has the potential to have impact on Mohave ground squirrel habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to brushlands with little groundcover, in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.28.4.4. Main D/Variation D

Potential impacts to the Mohave ground squirrel may occur with the implementation of this segment. The Mohave ground squirrel's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to brushlands with little groundcover, in comparison to Variation D, due to encompassing a smaller area.

4.4.28.4.5. Main E/Variation E

Potential habitat for the Mohave ground squirrel occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to Mohave ground squirrel habitat if implemented.

4.4.28.5. FREEWAY EXPRESSWAY (FREEWAY/TOLLWAY) WITH HSR ALTERNATIVE

The Freeway/Expressway (Freeway/Tollway) with HSR Alternative has a wider footprint when compared to the Freeway/Expressway (Freeway/Tollway) Alternative,

and therefore impacts to habitat for this species will be higher in comparison. The HSR Alternative increases the potential impact to this species proportional to the increase in scrubland community impacts, which can be viewed in Table 5. In addition to this, the HSR spur in Victorville that departs from the highway alignment would be an additional impact for this alternative, affecting approximately 85 acres of scrubland habitat, and thus result in increased impacts to habitat for this species.

4.4.28.5.1. Main Alignment/Common Areas

Within the BSA of the main alignment/common areas, impacts to Mohave ground squirrel have the potential to occur. Mojave ground squirrel habitat occurs throughout the proposed project corridor, within brushlands with little groundcover. Impacts to this species are expected to be low due to clearing and grubbing activities associated with the implementation of the proposed project. With the incorporation of the minimization measures listed above, the impacts to individuals of this species is expected to be low.

4.4.28.5.2. Main B/Variation B/Variation B1

This segment includes areas that are potential habitat to the Mohave ground squirrel, and with the implementation of this segment, impacts to the Mohave ground squirrel may occur. However, with the above mentioned avoidance and minimization measures, impacts to Mohave ground squirrel are expected to be low. Main B has the potential to have impact on Mohave ground squirrel habitat to a lesser extent than Variation B and Variation B1, as this option traverses less open space than these variations and at one location, bisects farmland rather than suitable habitat. Variation B requires considerably more acres of temporary and permanent impact to brushlands with little groundcover, in comparison to Main B and Variation B1, due to its alignment encompassing a greater area.

4.4.28.5.3. Main D/Variation D

Potential impacts to the Mohave ground squirrel may occur with the implementation of this segment. The Mohave ground squirrel's preferred habitat type is known to occur within the limits of this segment. However, with the avoidance and minimization measures mentioned above, impacts to this species would be minor. Main D would require fewer acres of permanent and temporary impacts to brushlands with little groundcover, in comparison to Variation D, due to encompassing a smaller area.

4.4.28.5.4. Main E/Variation E

Potential habitat for the Mohave ground squirrel occurs within this segment. With the avoidance and minimization measures mentioned in the previous section, impacts to

this species are to be considered low. Main E requires fewer acres for implementation in comparison to Variation E, therefore it will have less of an impact to Mohave ground squirrel habitat if implemented.

4.4.28.5.5. Rail Option 1A, 1B, 1C, 7A, 7B, & 7C

These rail options include areas that are potential habitat to the Mohave ground squirrel, and with the implementation of these options, impacts to the Mohave ground squirrel may occur. However, with the above mentioned avoidance and minimization measures, impacts to Mohave ground squirrel are expected to be low.

In a comparison of Rail Options 1A, 1B, 1C, 7A, 7B, and 7C there is no appreciable difference in impacts to this species habitat with the exception of Rail Option 1C and 7C, which both have small pockets of disturbed Joshua tree woodland. Because there is no special status plant or wildlife observed in any of these rail options, differences among them is not appreciable. All rail options are located within the same general vicinity with the majority of their areas comprised of either developed or disturbed land covers.

4.4.28.6. COMPENSATORY MITIGATION

The implementation of this proposed project would impact a relatively large amount of natural desert scrub habitats as described in Section 4.1. To reduce the impacts to these plant communities, similar plant communities within the region should be preserved in perpetuity.

Mitigation measures 1-4 (MM-1-4) shall be implemented to reduce impacts to this species. Impacts to individuals of this species will be mitigated for per consultation with the appropriate agencies.

4.4.28.7. CUMULATIVE EFFECTS

Impacts to individuals of this species with the implementation of this proposed project is expected to be low. When added to all other approved projects within the region the impact to individuals is expected to remain low. Considering the large expanses of suitable desert scrub habitat within the region impact to its habitat when added to all other approved projects will remain low. Preservation of occupied land could help this species by ensuring its continued existence.

Table 11: Impacts to Occupied/Foraging Habitats of Threatened and Endangered Species for the Freeway/Expressway and Freeway/Tollway Alternatives (acres)

Habitats of Species	Main Alignment/ Common Areas		Variation A Main		Variation A		Variation D Main		Variation D		Variation B Main		Variation B		Variation B1		Variation E Main			Variation E	
	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	No Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact
Parish's Daisy																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cushenbury Buckwheat																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cushenbury oxytheca																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Desert Tortoise																					
Occupied Habitat[2]	**738.28**	**360.88**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**296.94**	**175.46**	**341.92**	**212.94**	**319.09**	**184.22**	**0.14**	**281.48**	**75.88**	**140.58**	**215.27**
Least Bell's Vireo																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Southwestern Willow Flycatcher																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Swainson's Hawk																					
Foraging Habitat	463.67	318.06	206.73	96.78	209.09	98.97	0	0	0	0	0	0	0	0	0	0	0	299.05	99.35	168.45	208.25
Golden Eagle																					
Foraging Habitat	448.81	319.66	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	135.66	33.89	76.07	83.28
Western Yellow-billed Cuckoo																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mohave Ground Squirrel																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townsend's Big-eared Bat																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	**1650.76**	**998.6**	**206.73**	**96.78**	**209.09**	**98.97**	**0**	**0**	**0**	**0**	**296.94**	**175.46**	**341.92**	**212.94**	**319.09**	**184.22**	**0.14**	**716.19**	**209.12**	**385.1**	**506.8**

[2]Desert tortoise occupied habitat permanent impacts is based on the location of the permanent Right-of-Way fence around the Project, not necessarily on the vegetation communities. The corridor that will be within the fenced ROW will permanently restrict tortoises from entering. Despite an area being only temporarily impacted, if that area occurs within the fence ROW, it was considered a permanent impact.

Table 12: Impacts to Occupied/Foraging Habitats of Threatened and Endangered Species for the Freeway/Expressway and Freeway/Tollway Alternatives with HSR Feeder Service (acres)

Habitats of Species	Main Alignment/ Common Areas		Variation A Main		Variation A		Variation D Main		Variation D		Variation B Main		Variation B		Variation B1		Variation E Main			Variation E	
	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	No Impa ct	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact
Parish's Daisy																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cushenbury Buckwheat																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Cushenbury oxytheca																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Desert Tortoise																					
Occupied Habitat[2]	754.71	289.53	0	0	0	0	0	0	0	0	469.37	94.91	530.89	105.27	542.93	64.02	0.13	389.25	192.89	290.78	297.80
Least Bell's Vireo																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.86	0
Southwestern Willow Flycatcher																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.86	0
Swainson's Hawk																					
Foraging Habitat	503.14	283.76	325.22	60.57	0	0	0	0	0	0	0	0	0	0	0	0	0	397.73	240.08	393.21	228.96
Golden Eagle																					
Foraging Habitat	459.74	306.14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	173.18	155.81	236.45	114.93
Western Yellow-billed Cuckoo																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mohave Ground Squirrel																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Townsend's Big-eared Bat																					
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Totals	**1717.59**	**879.43**	**325.22**	**60.57**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**469.37**	**94.91**	**530.89**	**105.27**	**542.93**	**64.02**	**0.13**	**960.16**	**588.78**	**924.16**	**641.69**

[2]Desert tortoise occupied habitat permanent impacts is based on the location of the permanent Right-of-Way fence around the Project, not necessarily on the vegetation communities. The corridor that will be within the fenced ROW will permanently restrict tortoises from entering. Despite an area being only temporarily impacted, if that area occurs within the fence ROW, it was considered a permanent impact.

Table 13: Impacts to Occupied/Foraging Habitats of Threatened and Endangered Species for the Freeway/Expressway and Freeway/Tollway Alternatives with HSR Feeder Service (Rail Options) (acres)

1Habitats of Species	Option 1A		Option 1B		Option 1C		Option 7A		Option 7B		Option 7C	
	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact	Perm. Impact	Temp. Impact
Parish's Daisy												
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0
Cushenbury Buckwheat												
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0
Cushenbury oxytheca												
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0
Desert Tortoise												
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0
Least Bell's Vireo												
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0
Southwestern Willow Flycatcher												
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0
Swainson's Hawk												
Foraging Habitat	1.34	30.31	0.03	29.57	5.48	38.13	22.56	48.64	24.13	46.22	32.01	68.2
Golden Eagle												
Foraging Habitat	0	0	0	0	0	0	0	0	0	0	0	0
Western Yellow-billed Cuckoo												
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0
Mohave Ground Squirrel												
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0
Townsend's Big-eared Bat												
Occupied Habitat	0	0	0	0	0	0	0	0	0	0	0	0
Totals	**1.34**	**30.31**	**0.03**	**29.57**	**5.48**	**38.13**	**22.56**	**48.64**	**24.13**	**46.22**	**32.01**	**68.2**

Table 14: Avoidance and Minimization/Mitigation Measures

Measure #	Description of Measure
Avoidance and Minimization Measure 1 AMM-1	Impacts to this species can be minimized, by requiring a biological monitor to be present on site during initial clearing and grubbing activity to capture and relocate any individuals. If areas of high-density occurrences are found, salvage efforts can be made by more carefully removing shrubs with clam-shell loaders and searching for individuals at the base of the shrub or within the root system as this is a more likely place for them to occur. Habitat for this species can be re-established within temporary impact zones between the highway and edge of R.O.W. This area should be replanted with native plants similar to the natural surrounding area and the soil compacted only to a point necessary for construction purposes. This will allow any natural occurring individuals within the immediate vicinity to re-populate the temporary impact zone.
Avoidance and Minimization Measure 2 AMM-2	A qualified biologist will recommend approved limits of disturbance, including construction staging areas and access routes, to minimize impacts to adjacent habitat. To ensure the avoidance of impacts to migratory birds, the following measures will be implemented pursuant to the Migratory Bird Treaty Act (MBTA). Clearing and grubbing of vegetation will be conducted outside of bird-nesting season. If clearing and grubbing of vegetation needs to be conducting during bird-nesting season (February 15th to September 1st), a qualified biologist will monitor construction during clearing, grading and/or trenching activities for any occurrence of birds nesting. In the event birds are observed nesting, construction should stop until it is determined that the fledglings have left their nests. If this is not possible, coordination with the a qualified biologist should take place in order to minimize the risk of violating the Migratory Bird Treaty Act, and the following minimization measure put in place: an ESA fencing buffer of 150 ft. for songbirds, and 500 ft. for raptors which must be maintained during all phases of construction.
Avoidance and Minimization Measure 3 AMM-3	A qualified biologist will recommend approved limits of disturbance, including construction staging areas and access routes, to minimize impacts to adjacent habitat. To ensure the avoidance of impacts to bats, pre-construction surveys will be conducted of rock faces adjacent to the roadway, and any trees designated for removal due to the initiation of construction related activities to assess any potential presence of the species. Clearing and grubbing of vegetation will be conducted outside of the bat maternity season. If clearing and grubbing of vegetation needs to be conducted during bat maternity season (March 1st to October 15th), a qualified biologist will monitor construction during clearing, grading and/or trenching activities for any occurrence of the species breeding. If any species are found during pre-construction surveys they will be excluded using CDFW, USFS, and USFWS approved methods. Alternate bat habitat will be provided for any excluded bats.
Avoidance and Minimization Measure 4 AMM-4	A biological monitor shall be present a minimum of one week prior to clearing and grubbing activities in order to walk the proposed areas to be cleared and grubbed and dispel animals that have the ability to flee.
Avoidance and Minimization Measure 5	A qualified biologist shall survey for, trap/capture species present, and relocate to a designated area approved by USFWS or CDFW

Measure #	Description of Measure
AMM-5	
Mitigation Measure 1 MM-1	Replanting appropriate native habitat in temporarily impacted areas. Additionally, a Habitat Mitigation Monitoring Plan (HMMP) shall be established.
Mitigation Measure 2 MM-2	Restoration of disturbed habitat within the project limits shall be conducted.
Mitigation Measure 3 MM-3	Like-habitat conducive to this species habitat requirements shall be purchased and preserved in perpetuity
Mitigation Measure 4 MM-4	The boundaries of right-of-way shall be fenced off with approved materials for the following reasons: 1) serve as a guide for wildlife to utilized the appropriate crossings meanwhile reducing impacts to wildlife/vehicle collisions, and 2) reduce vandalism to restoration sites
Listed Plants	
BPL-1:	Prior to the start of any ground disturbing activities within any previously undisturbed rare plant suitable habitat, conduct focused plant surveys at a time prior to construction when detection is most optimal, such as normal rainfall years. If the results of surveys indicate presence of any of the species identified in Table 3.3.3-1 (Special-Status Plant Species with Potential to Occur in the Biological Study Area), then BPL-2 and BPL-3 will be implemented.
BPL-2:	Provide a biological monitor onsite to establish an environmentally sensitive area (ESA) around the areas where each special-status species occurs. The biological monitor shall have the authority to establish ESAs in potential suitable habitat areas where rare plant preconstruction surveys were conducted; however, due to low rainfall these areas may still represent potential habitat even if special-status plants were not observed. In addition, any special-status plant occurrences identified within the ROW that can be avoided during construction and preserved in place, shall be established as an ESA as a construction avoidance area by the biological monitor.
BPL-3:	Coordinate with CDFW regarding the collection and propagation of bulbs and plants, as well as seed bulking. Only a CDFW-approved nursery may be used for these activities. If it is determined that mitigation locations for replanting bulbs, applying seed, replanting salvaged plants, or planting propagated plants is more appropriate at an off-site location, then this location shall be coordinated with all applicable resource agencies. In some cases, it may be more practical to provide funding for an In-Lieu Fee Program, or to purchase mitigation credits from a mitigation bank. These options shall be explored if other mitigation options are not feasible.
Golden Eagle and Swainson's Hawk	
BTE-1:	A qualified biologist will recommend approved limits of disturbance, including construction staging areas and access routes, to minimize impacts to adjacent habitat. To ensure the avoidance of impacts to migratory birds, the following measures will be implemented pursuant to the FGC 3503 and Migratory Bird Treaty Act (MBTA). A qualified biologist shall be present a minimum of 1 week prior to and during clearing and

Measure #	Description of Measure
	grubbing activities to walk the proposed areas to be cleared and grubbed. Clearing and grubbing of vegetation will be conducted outside of the bird-nesting season. If clearing and grubbing of vegetation needs to be conducted during the bird-nesting season (February 15 to September 1) or if any other ground-disturbing activities are to begin during the bird-nesting season, a qualified biologist will monitor construction during clearing, grading, and/or trenching activities for any occurrence of the birds nesting. If birds are observed nesting, construction should stop until it is determined by the qualified biologist that the fledglings have left their nests or the nest becomes inactive. If this is not possible, coordination with a qualified biologist should take place to minimize the risk of violating the MBTA, and the following minimization measure should be considered: an environmentally sensitive area (ESA) fencing buffer shall be placed at a distance of 150 feet for songbirds and 500 feet for raptors, which must be maintained during all phases of construction, or a biological monitor shall be present during construction activities to monitor for signs of disturbance or modification of behavior.
BTE-2:	Compensatory Mitigation:Depending on the alternative and variations that are chosen, up to approximately 696.19 acres of suitable foraging habitat for golden eagle could be permanently converted to a paved transit facility with the implementation of the proposed project. Conversations with USFWS and CDFW personnel suggest similar or greater quality habitat be preserved and managed for the benefit of golden eagle at the same amount that would be impacted to achieve a no net loss in habitat. Therefore, Caltrans will purchase and preserve in perpetuity at least the same amount of acres of suitable golden eagle foraging habitat that is permanently affected.
BTE-3:	Compensatory Mitigation: Depending on the alternative, variation, and option that are chosen, up to approximately 1,263.58 acres of suitable foraging habitat for Swainson's hawk could be permanently converted to a paved transit facility with the implementation of the proposed project. The document "Swainson's Hawk Survey Protocols, Impact Avoidance, and Minimization Measures for Renewable Energy Projects in the Antelope Valley of Los Angeles and Kern Counties, California" and additional conversations with CDFW and managed for the benefit of Swanson's hawk at the same amount that would be impacted to achieve a no net loss in habitat. Therefore, Caltrans will purchase and preserve in perpetuity at least the same amount of acres of suitable Swainson's hawk foraging habitat that is permanently affected.
Southwestern Willow Flycatcher and Least Bell's Vireo	
BTE-4:	Areas outside of the proposed construction zone will be designated as an ESA, and no work will be conducted within these areas to avoid potential impacts to southwestern willow flycatcher critical habitat. These areas will be fenced off clearly by use of obvious exclusion fencing prior to the onset of ground disturbance. The fencing will remain in place while the project is being constructed. An approved avian biologist will oversee the placement and design of this fencing. This measure applies to work activities in or around riparian vegetation within the Preferred Alternative.
BTE-5:	Standard Best Management Practices (BMPs) will be implemented by Caltrans to protect ecologically important resources in the construction zone. General stormwater BMPs and conservation measures will be

Measure #	Description of Measure
	implemented during project construction to avoid any potential for downstream sedimentation effects to southwestern willow flycatcher critical habitat. The BMPs of the Storm Water Pollution Prevention Plan (SWPPP) will be designed to avoid potential indirect effects to southwestern willow flycatcher critical habitat downstream.
BTE-6:	Noise effects will not exceed 60 A-weighted decibels (dBA) Leq at 1,000 feet averaged over one hour from the Project boundaries.
BTE-7:	Prior to the initiation of construction activities, all project personnel will be educated regarding the least Bell's vireo, southwestern willow flycatcher, and southwestern willow flycatcher critical habitat within and adjacent to the project area. Construction personnel are to remain outside of the critical habitat, unless within the approved work area.
BTE-8:	The lighting on the new bridge over the Mojave River, the viaduct west of Gas Line Road, and along constructed roadways will consist of directional lighting that focuses the light on the roadway or the HSR.
BTE-9:	During rock-blasting activities for bridge construction over the Mojave River, rockfall protection measures will be implemented to prevent any rock or debris resulting from the blasting to roll into the Mojave River to avoid impacts to water flow downstream. This measure applies to project activities in the Mojave River only.
BTE-10:	In compliance with Executive Order (EO) 13112, a weed abatement program will be developed to minimize the importation of nonnative plant material during and after construction to avoid impacts to riparian vegetation downstream. Eradication strategies would be employed should an invasion occur.
Desert Tortoise	
BTE-11:	Compensatory Mitigation: The loss of desert tortoise habitat will be compensated for by paying compensation at a 1 to 1 ratio for permanent, adverse effects up to a maximum of 1,590.36 acres of desert tortoise habitat. Compensation will include the acquisition of land within a Desert Wildlife Management Area and/or contribution of an equivalent monetary value towards recovery actions in West Mojave. Recovery actions can include restoration, closing roads, fencing installation, repairs or purchase and discontinued use of Bureau of Land Management (BLM) grazing allotments. If the project design changes and increases or decreases the total amount of desert tortoise habitat that is adversely affected, Caltrans would pay compensation for the total amount of acres that are permanently lost.
BTE-12:	An authorized biologist is a person the USFWS has approved to conduct specific activities to protect desert tortoises during the implementation of a project (e.g., clearance surveys, handling of individuals, etc.). A desert tortoise monitor (monitor) is a person who assists the authorized biologists in protecting desert tortoises. The authorized biologist is responsible for supervising monitors and ensuring that monitors are sufficiently trained to perform assigned tasks, including the handling of desert tortoises. Authorized biologists and monitors are responsible for monitoring project activities within desert tortoise habitat, ensuring proper implementation of protective measures, and recording and reporting desert tortoise observations. Monitors report incidents of non-compliance to authorized biologists, and authorized biologists turn in reports of non-

Measure #	Description of Measure
	compliance to Caltrans and the USFWS immediately.
BTE-13:	Caltrans will employ an appropriate number of authorized biologists and monitors during construction of the HDC transportation facility for the protection of the desert tortoise. Authorized biologists will monitor each activity where conditions exist that may result in injury or mortality of desert tortoise (e.g., clearing, grading, re-contouring, and restoration activities).
BTE-14:	Caltrans will review and provide the credentials of all individuals seeking approval as authorized biologists to the USFWS at least 30 days prior to the time they are needed in the field.
BTE-15:	Authorized biologists and monitors will have the authority to halt any activity immediately that does not comply with the protective measures described in the biological opinion and report non-compliance to Caltrans and then to the USFWS.
BTE-16:	Individuals approved to capture and handle desert tortoises, perform pre-project clearance surveys, move desert tortoises out of harm's way, excavate burrows, handle nests and eggs, construct artificial burrows, and temporarily confine desert tortoises will do so in compliance with the Desert Tortoise Field Manual (USFWS 2009) or most up-to-date USFWS guidance. The Desert Tortoise Field Manual can be found at http://www.fws.gov/carlsbad/PalmSprings/DesertTortoise.html. Individuals approved to perform these tasks include authorized biologists and monitors who are under the direct supervision of an authorized biologist.
BTE-17:	An authorized biologist will be present during the removal of desert tortoise habitat east of 240th Street East; if an authorized biologist is within the immediate area and directly overseeing the habitat removal, a monitor can directly supervise vegetation removal.
BTE-18:	Prior to construction, Caltrans will install a temporary desert tortoise exclusion fence around all project areas in desert tortoise habitat, including staging and storage areas, as determined by an authorized biologist between 240th Street East and the eastern end of the project. Roads crossing the HDC will terminate at the exclusion fence and turnarounds will be developed. Caltrans will install the exclusion fences as specified in the USFWS's Desert Tortoise Field Manual (2009) or most up-to-date USFWS guidance. utilized
BTE-19:	Authorized biologists and monitors will conduct daily clearance surveys of desert tortoise exclusion fence alignments during installation and monitor installation at all times. After exclusion fence construction is completed, authorized biologists and monitors will conduct 100 percent clearance surveys within the exclusion fence. Desert tortoises that are found inside the fence will be translocated, in accordance with the specifications established by the most up-to-date USFWS guidelines.
BTE-20:	To the maximum extent practicable, Caltrans will place fence alignments and the features that they are enclosing (e.g., road alignment, etc.) in a manner that reduces the number of desert tortoises that must be moved off the project site.
BTE-21:	The authorized biologist will use their best judgment regarding measures to use to ensure that desert tortoises do not immediately return to fenced areas or other areas they have been moved from to ensure their

Measure #	Description of Measure
	protection. The authorized biologist may use temporary penning, in accordance with the Desert Tortoise Field Manual (USFWS 2009) or most up-to-date USFWS guidance, to prevent desert tortoises from re-entering these areas during construction.
BTE-22:	Caltrans will install shade structures, in accordance with the Desert Tortoise Field Manual (2009) or most up-to-date USFWS guidance, at regular intervals along exclusion fence to provide shade for desert tortoises that exhibit fence-pacing behavior.
BTE-23:	Caltrans will inspect the temporary exclusion fence twice per week and repair, when necessary, during the construction of the HDC transportation facility to ensure that desert tortoises are excluded from the construction area.
BTE-24:	Caltrans will confine all construction activities, project vehicles, and equipment to the area within the exclusion fence.
BTE-25:	Authorized biologists will conduct health assessments, in accordance with the Health Assessment Handbook (USFWS 2013b) or most up-to-date USFWS guidelines, on all desert tortoises found during the clearance surveys for clinical signs of disease prior to translocation. If any desert tortoises are found with signs of disease, Caltrans will contact the USFWS to determine further actions. Any authorized biologist conducting health assessments must be approved by USFWS to perform these duties after attending and passing the USFWS health assessment course.
BTE-26:	California Department of Fish and Wildlife (CDFW) and USFWS will approve Caltrans' translocation site(s) and translocation plan before construction commences. Caltrans will translocate desert tortoises to suitable habitat within the southern portion of the Fremont-Kramer Critical Habitat Unit or the Monkeyflower Area of Critical Environmental Concern as determined by USFWS and CDFW.
BTE-27:	Desert tortoises will be translocated and released into suitable habitat and placed in the shade of a shrub. If an individual is found in a burrow, the desert tortoise will be excavated from the burrow and translocated to an unoccupied burrow similar to the hibernaculum in which it was found. Translocated desert tortoises will not be placed in existing occupied burrows. If an existing burrow that is similar in size, shape, and orientation to the original burrow is unavailable, the authorized biologist will construct one in accordance with the Desert Tortoise Field Manual (USFWS 2009) or most up-to-date USFWS guidance.
BTE-28:	Caltrans will monitor survivorship and movement activity for translocated desert tortoises for up to five years using radio telemetry in accordance with the Desert Tortoise Monitoring Handbook (USFWS 2015c) or most up-to-date USFWS guidance.
BTE-29:	Caltrans will ensure that all workers associated with the transportation facility receive worker environmental awareness training to ensure the protection of the desert tortoise and its habitat. Caltrans will develop and implement the program and an authorized biologist or monitor will administer the training to all personnel. The worker environmental awareness training will: a. Be developed by or in consultation with an authorized biologist and

Measure #	Description of Measure
	consist of a presentation in which supporting written material and electronic media, including photographs of protected species, are made available to all participants; b. Discuss general conditions of the Act, necessity for adhering to the requirements of the Act, potential for civil and criminal penalties associated with violating the provisions of the Act, and specific requirements for complying with the provisions of the Act as they relate to the project; c. Place special emphasis on the natural history of the desert tortoise, including information on physical characteristics, photographs, distribution, behavior, ecology, and sensitivity to human activities; d. Describe construction activities that may affect the desert tortoise and its habitat, the purpose and function of the desert tortoise avoidance and minimization measures, legal protections and penalties, reporting requirements and procedures for personnel if non-compliance of environmental requirements occurs; e. Inform workers that the authorized biologists and monitors have the authority to halt work in any area where an unauthorized adverse impact to biological resources may occur if the activities continued; f. Discuss general safety protocols such as hazardous substance spill prevention and containment measures and fire prevention and protection measures; g. Describe project site boundaries within which project activities may be conducted; h. Provide contact information for the authorized biologists and monitors to handle late comments and questions about the material discussed in the program, as well as notification of any dead or injured wildlife species encountered during project-related activities; i. Direct all workers to report all observations of listed species and their sign to an authorized biologist for inclusion in the yearly compliance report; j. Include a training acknowledgment form to be signed by each worker indicating that they received training and will abide by the guidelines; k. Provide information regarding the effects of predation on the desert tortoise by common ravens (Corvus corax) and other predators and describe preventative measures that reduce the likelihood that predators will be attracted to the project area; l. Warn of the potential for desert tortoises to take refuge under vehicles and to notify an authorized biologist in that event; and m. Describe the specific procedures to be followed to move a desert tortoise that may be in imminent danger (i.e., on a heavily traveled road without an authorized biologist nearby).
BTE-30:	Caltrans will have an authorized biologist on-site during ground-disturbing activities to move any desert tortoises out of harm's way that may have been missed during clearance surveys. If a desert tortoise, whether dead, injured, or entrapped, is found in the project area after the 100 percent clearance survey is completed, all work within the area will halt.
BTE-31:	All vehicles and equipment on project sites, including private automobiles parked outside of areas that have desert tortoise exclusion fencing, must be inspected by drivers prior to moving them to ensure that desert

Measure #	Description of Measure
	tortoises have not moved underneath the parked vehicle. If project personnel encounter a desert tortoise, they will contact an authorized biologist, and the desert tortoise will be allowed, under its own volition, to move a safe distance away prior to moving the vehicle. Inspection flags will be placed on heavy equipment at the end of the day to remind drivers to look under them prior to startup.
BTE-32:	If a desert tortoise is found in a construction area where fencing was deemed unnecessary, work will cease until the individual leaves under its own volition to a safe distance out of harm's way. The authorized biologist will decide upon the extent of additional surveys and fencing needed.
BTE-33:	No desert tortoise will be captured, moved, transported, released, or purposefully caused to leave its burrow for any reason when the ambient air temperature is above 95 degrees Fahrenheit (°F). No desert tortoise will be captured if the ambient air temperature is anticipated to exceed 95°F before handling or processing can be completed. If the ambient air temperature exceeds 95°F during handling or processing, desert tortoises will be kept shaded in an environment that does not exceed 95°F, and not released until ambient air temperature declines to below 95°F.
BTE-34:	Caltrans will contain all trash associated with the project that could provide subsidies to predators in secure, self-closing receptacles. Caltrans will also remove and dispose of all road-killed animals on the project to prevent the introduction of subsidized food resources for common ravens and coyotes (Canis latrans).
BTE-35:	Caltrans will ensure that workers do not bring firearms and pets into the project area. Firearms carried by authorized security and law enforcement personnel are exempt from this measure.
BTE-36:	Caltrans and the contractor will follow the standard best management practice field manual (Caltrans 2003) with regard to dust, erosion, and sediment control.
BTE-37:	Project personnel will ensure water used for construction does not create standing water that could attract desert tortoises or predators, such as common ravens and coyotes, to the site. When not in use, all water sources such as hydrants or open water trucks will be covered to prevent use by animals.
BTE-38:	Culverts in desert tortoise habitat will have soft bottoms and will allow desert tortoises to enter and exit safely from each end.
BTE-39:	Signs will be placed, as needed, to indicate the need to reduce speeds on roadways and strictly confine activities to the project area. All site personnel will adhere to a 35 miles per hour speed limit in unfenced areas (Caltrans 2016).
BTE-40:	Caltrans will prevent the introduction or further spread of invasive and non-native species during and after construction to the work area by developing a weed abatement program.
BTE-41:	Permanent desert tortoise exclusion fencing, in accordance with the Desert Tortoise Field Manual (USFWS 2009) or most up-to-date USFWS guidance will be installed parallel to the outside edge of the operational areas of the project, not necessarily the rights-of-way edge, in areas of suitable habitat where bridges are not located. This fencing will be a part of standard highway inspections and maintained in perpetuity. Roads that

Measure #	Description of Measure
	cross the HDC in desert tortoise habitat will be terminated and turnarounds will be used.
BTE-42:	Wildlife-proof trash containers will be installed and regularly emptied at all rest stops or train stations associated with the HDC transportation facility.
BTE-43:	Perching opportunities for common ravens and raptors near habitat supporting desert tortoise will be limited, structures incorporating a design to discourage raven and raptor perching should be selected including Avian Power Line Interaction Committee guidelines (APLIC 2006) for avoiding unintended injuries to birds.
Townsend's Big-Eared Bat	
BTE-44:	A qualified biologist will recommend approved limits of disturbance, including construction staging areas and access routes, to minimize impacts to adjacent habitat. To ensure the avoidance of impacts to bats, preconstruction surveys will be conducted of rock faces adjacent to the roadway and any trees designated for removal due to the initiation of construction-related activities to assess any potential presence of the species. This preconstruction survey would be conducted prior to start of construction within any potential bat roost habitat at any time of year. Clearing and grubbing of vegetation will be conducted outside of the bat maternity season (December 1 to February 14). If clearing and grubbing of vegetation needs to be conducted during the bat maternity season (February 15 to November 30), a qualified biologist will monitor construction during clearing, grading, and/or trenching activities for any occurrence of the species breeding. If any species are found during preconstruction surveys, they will be excluded using CDFW, U.S. Forest Service (USFS), and USFWS-approved methods. Alternate bat habitat will be provided for any excluded bats.

4.5. Jurisdictional Waters[AA7]

4.5.1. Survey Results for Jurisdictional Waters

The BSA includes two major watersheds; Antelope-Fremont Valleys Watershed and the Mojave River Watershed. All of the drainages within the BSA in the Antelope-Fremont Valleys HUC-8 watershed are considered isolated and as such, the wetland and non wetland waters in this watershed are not under the jurisdiction of the USACE. CDFW and RWQCB, however, maintain jurisdiction over the wetland and non wetland waters identified within this watershed. The characteristics observed within the mapped features suggest that they channel surface water, hence they are likely jurisdictional as Waters of the State and regulated by RWQCB and by CDFW as streambeds. Additional details on the features mapped in this watershed are included in the State Jurisdictional Delineation (2015) report in Appendix I. A combined total of approximately 157.44 acres of hydrological features were mapped within the BSA inclusive of all variations to the proposed alternatives (see Appendix I).

In contrast to the Antelope-Fremont Valley Watershed, the USACE would consider all non-RPWs with an OHWM and physical surface channel connectivity to the Mojave River to be under USACE jurisdiction. There are two closed basin sub-watersheds within the Mojave River Watershed, Apple Pond-Apple Valley Dry Lake (HUC 180902080304) and El Mirage Lake (HUC 180902080404) and features within these subwatersheds are not regulated by USACE. However, when characteristics observed within the mapped features suggest that they channel surface water, they are likely jurisdictional as Waters of the State and regulated by RWQCB and by CDFW as streambeds.

Some of the hydrological features originally identified as jurisdictional in pervious technical studies were determined to be non-jurisdictional to one or more of the agencies (USACE, SWRCB or CDFW). These were isolated and erosional features thay vary in their lack of hydrophytic vegetation, OHWM, and hydrological connection or biological functions.

To determine the estimated acreages of jurisdictional features associated with an alternative/variation/option, calculations are divided to differentiate between the main alignment/common areas, the main alignment variations, the variation dips, and the rail options. These acreages should be considered preliminary until designs are finalized and jurisdiction is verified by USACE, SWRCB, and CDFW.

4.5.1.1. FREEWAY/EXPRESSWAY ALTERNATIVE

Potentially jurisdictional waters identified under this alternative will be quantified by USACE, SWRCB and CDFW jurisdiction. The jurisdictional waters will then be further discussed by the Main Alignment common areas, by Main A, B, D, E, and by Variations A, B, B1, D, and E.

Approximately 121.18 acres of hydrological features were mapped within the BSA inclusive of all variations to the Freeway/Expressway Alternative.

4.5.1.2. FREEWAY/TOLLWAY ALTERNATIVE

Potentially jurisdictional waters identified under this alternative would be the same as the jurisdictional waters identified under the Freeway/Expressway Alternative (with Main Alignment common areas, Main A, B, D, E, and Variations A, B, B1, D, and E). This alternative follows the same footprint as the Freeway/Expressway Alternative, but it would have sections that operate as a tollway.

4.5.1.3. FREEWAY/EXPRESSWAY ALTERNATIVE WITH THE HSR FEEDER SERVICE

Potentially jurisdictional waters identified under this alternative will be quantified by USACE, SWRCB and CDFW jurisdiction. The jurisdictional waters will then be

further discussed by the Main Alignment common areas, Rail Options 1ABC, Rail Options 7ABC, and by Main B, D, E, and Variations B, B1, D, and E with HSR Feeder Service.

Approximately 157.44 acres of hydrological features were mapped within the BSA inclusive of all variations to the Freeway/Expressway Alternative with the HSR Feeder Service.

4.5.1.4. FREEWAY/TOLLWAY ALTERNATIVE WITH THE HSR FEEDER SERVICE

Potentially jurisdictional waters identified under this alternative would be the same as the jurisdictional waters identified under the Freeway/Expressway Alternative with the HSR Feeder Service (with Main Alignment common areas, Rail Options 1ABC, Rail Options 7ABC, Main B, D, E, and Variations B, B1, D, and E with HSR Feeder Services). This alternative follows the same footprint as the Freeway/Expressway Alternative, but it would have sections that operate as a tollway.

4.5.2. Avoidance and Minimization Efforts for Jurisdictional Waters

Complete avoidance of permanent impacts to jurisdictional features was determined not possible in achieving the project purpose. The project has been designed to minimize temporary and permanent impacts to WUS, WSC and CDFW jurisdictional areas to the maximum extent practicable. Due to the topography associated with the eastern portion of the project within the Mojave River valley, the proposed main alignment will be constructed with an above grade separation supported by piers. This preliminary design will ease the fluctuations of the corridor over the terrain and avoid or minimize impacts to the following jurisdictional features:

- Mojave River and several contributing unnamed washes
- Bell Mountain Wash and several contributing unnamed washes
- Ossum Wash
- Turner Wash and a contributing unnamed wash

Project alternatives and pier locations will continue to be refined to include measures to protect sensitive areas and to maintain the hydrological integrity of the jurisdictional washes.

4.5.2.1. USACE JURISDICTION

4.5.6.1.1. Freeway/Expressway (Freeway/Tollway) Alternative

4.5.6.1.1.1. Main Alignment/Common Areas

Fremont Wash and its numerous contributing washes are both expected to have box culverts installed to maintain hydrologic integrity and support wildlife movement. These will be further analyzed during design refinement with proposals for full-span or non-embedded culverts above the OHWM to avoid permanent impacts to the extent feasible. Beneficial impacts include cooler temperatures and shelter within the box culverts for wildlife species and their movement.

Bell Mountain Wash and its numerous contributing washes are expected to have clear-span bridge structures, requiring no fill below the OHWM of the washes. This will avoid permanent and temporary direct impacts to jurisdictional areas. This wash does not have USACE-defined wetlands or riparian vegetation and is not considered shade-sensitive; permanent indirect impacts are not expected. Beneficial impacts include cooler temperatures and shelter for wildlife species under the bridges.

Any work within the ephemeral washes will be conducted when there is no flow [MB8]in the channel.

Temporary construction staging areas and unpaved access roads will be strategically placed to avoid and/or minimize impacts to USACE jurisdictional features to the extent feasible and are expected to be restored to pre-project conditions, through landscape restoration and the use of geotech fabric under roads to identify the previous grade and to maintain the topsoil.

4.5.6.1.2. Variations A and D

Potential USACE jurisdictional features were not identified within the BSA of Variations A, B, B1, and D of the Freeway/Expressway (Freeway/Tollway) Alternative.

4.5.6.1.3. Main B and Variations B, B1

Fremont Wash and its contributing unnamed washes expected to have box culverts installed to maintain hydrologic integrity and support wildlife movement. These will be further analyzed during design refinement with proposals for full-span or non-embedded culverts above the OHWM to avoid permanent impacts to the extent feasible. Beneficial impacts include cooler temperatures and shelter within the box culverts for wildlife species and their movement.

4.5.6.1.4. Main E and Variation E

Due to the biological resources associated with the Mojave River, two parallel bridges were being proposed with three options. However, due to the direct impacts associated with Option 1 and 2, they have been eliminated as viable options:

- Mojave River Bridges will avoid permanent and temporary direct impacts to jurisdictional areas.
- Turner Wash and Ossum Wash are expected to have clear-span bridge structures, requiring no fill below the OHWM of the washes. This will avoid permanent and temporary direct impacts to jurisdictional areas. These washes do not have USACE-defined wetlands or riparian vegetation and is not considered shade-sensitive; permanent indirect impacts are not expected. Beneficial impacts include cooler temperatures and shelter for wildlife species under the bridges.
- Any work within the ephemeral washes will be conducted when there is no flow in the channel[MB9].
- Numerous washes that contribute to Fremont Wash within this Variation are expected to have full-span or non-embedded culverts above the OHWM to avoid permanent impacts to the extent feasible. Beneficial impacts include cooler temperatures and shelter within the box culverts for wildlife species and their movement.
- Temporary construction staging areas and unpaved access roads will be strategically placed to avoid and/or minimize impacts to USACE jurisdictional features to the extent feasible and are expected to be restored to pre-project conditions, through landscape restoration and the use of geotech fabric under roads to identify the previous grade and to maintain the topsoil.

4.5.6.1.5. Freeway/Expressway (Freeway/Tollway) Alternative with the HSR Feeder Service

4.5.6.1.5.1. Main Alignment/Common Areas

Fremont Wash and its contributing washes are expected to have box culverts installed to maintain hydrologic integrity and support wildlife movement. These will be further analyzed during design refinement with proposals for full-span or non-embedded culverts above the OHWM to avoid permanent impacts to the extent feasible. Beneficial impacts include cooler temperatures and shelter within the box culverts for wildlife species and wildlife movement.

Bell Mountain Wash and its contributing washes are expected to have clear-span bridge structures, requiring no fill below the OHWM of the washes. This will avoid

permanent and temporary direct impacts to jurisdictional areas. This wash does not have USACE-defined wetlands or riparian vegetation and is not considered shade-sensitive; permanent indirect impacts are not expected. Beneficial impacts include cooler temperatures and shelter for wildlife species under the bridges.

Any work within the ephemeral washes will be conducted when there is no flowin the channel[MB10].

Temporary construction staging areas and unpaved access roads will be strategically placed to avoid and/or minimize impacts to USACE jurisdictional features to the extent feasible and are expected to be restored to pre-project conditions, through landscape restoration and the use of geotech fabric under roads to identify the previous grade and to maintain the topsoil.

4.5.6.1.5.2. Rail Option 1, Rail Option 7 and Variation D

Potential USACE jurisdictional features were not identified within the BSA of Rail Options 1 and 7 and Variation D of the Freeway/Expressway (Freeway/Tollway) Alternative with the HSR Feeder Service.

4.5.6.1.5.3. Main B and Variations B, B1

Fremont Wash and contributing unnamed washes are both expected to have box culverts installed to maintain hydrologic integrity and support wildlife movement. These will be further analyzed during design refinement with proposals for full-span or non-embedded culverts above the OHWM to avoid permanent impacts to the extent feasible. Beneficial impacts include cooler temperatures and shelter within the box culverts for wildlife species and their movement.

4.5.6.1.5.4. Main E with HSR Feeder Service

Due to the biological resources associated with the Mojave River, three parallel bridges are being proposed. A westbound (WB) freeway bridge, two-lane rail bridge, and an eastbound (EB) freeway bridge.

- Mojave River Bridges will avoid permanent and temporary direct impacts to jurisdictional areas.
- Turner Wash and Ossum Wash are expected to have clear-span bridge structures, requiring no fill below the OHWM of the washes. This will avoid permanent and temporary direct impacts to jurisdictional areas. These wash do not have USACE-defined wetlands or riparian vegetation and is not considered shade-sensitive; permanent indirect impacts are not expected.

Beneficial impacts include cooler temperatures and shelter for wildlife species under the bridges.

- Bell Mountain Wash is expected to have clear-span bridge structures, requiring no fill below the OHWM of the washes. This will avoid permanent and temporary direct impacts to jurisdictional areas. This wash does not have USACE-defined wetlands or riparian vegetation and is not considered shade-sensitive; permanent indirect impacts are not expected. Beneficial impacts include cooler temperatures and shelter for wildlife species under the bridges.

- Numerous washes that contribute to Fremont Wash within this Variation are expected to have full-span or non-embedded culverts above the OHWM to avoid permanent impacts to the extent feasible. Beneficial impacts include cooler temperatures and shelter within the box culverts for wildlife species and their movement.

- Any work within the ephemeral washes will be conducted when there is no flow in the channel[MB11].

- Temporary construction staging areas and unpaved access roads will be strategically placed to avoid and/or minimize impacts to USACE jurisdictional features to the extent feasible and are expected to be restored to pre-project conditions, through landscape restoration and the use of geotech fabric under roads to identify the previous grade and to maintain the topsoil.

4.5.6.1.5. Variation E with HSR Feeder Service

Due to the biological resources associated with the Mojave River, three parallel bridges are being proposed with two options. A westbound (WB) freeway bridge, two-lane rail bridge, and an eastbound (EB) freeway bridge.

- Mojave[MB12] River Bridges will avoid permanent and temporary direct impacts to jurisdictional areas. Mojave River Bridges avoids permanent direct impacts to jurisdictional areas.

- Turner Wash and Ossum Wash are expected to have clear-span bridge structures, requiring no fill below the OHWM of the washes. This will avoid permanent and temporary direct impacts to jurisdictional areas. These wash do not have USACE-defined wetlands or riparian vegetation and is not considered shade-sensitive; permanent indirect impacts are not expected. Beneficial impacts include cooler temperatures and shelter for wildlife species under the bridges.

- The numerous washes that contribute to Fremont Wash within this Variation are expected to have full-span or non-embedded culverts above the OHWM to avoid permanent impacts to the extent feasible. Beneficial impacts include cooler temperatures and shelter within the box culverts for wildlife species and their movement.
- Any work within the ephemeral washes will be conducted when there is no flow in the channel[MB13].
- Temporary construction staging areas and unpaved access roads will be strategically placed to avoid and/or minimize impacts to USACE jurisdictional features to the extent feasible and are expected to be restored to pre-project conditions, through landscape restoration and the use of geotech fabric under roads to identify the previous grade and to maintain the topsoil.

4.5.2.2. CDFW JURISDICTION

4.5.6.2.1. All Alternatives/Variations/Options

Bridges will be designed outside of CDFW jurisdiction to the extent feasible and will be constructed to avoid and minimize permanent impacts to the washes.

- Mojave[MB14] River Bridges will avoid permanent and temporary direct impacts to jurisdictional areas.
- Big Rock Wash is expected to have a multi-span bridge structure that will maintain hydrologic integrity and support wildlife movement. This will be further analyzed during design refinement with proposals for a clear-span bridge structure with piers, pilings or footings located above the streambed, bank and channel to avoid permanent impacts to the channel and to hydrophytic vegetation to the extent feasible.
- Little Rock Wash is expected to have multi-span bridge structures that will maintain hydrologic integrity and support wildlife movement. These will be further analyzed during design refinement with proposals for a clear-span bridge structure with piers, pilings or footings located above the streambed, bank and channel to avoid permanent impacts to the extent feasible. This wash does not have CDFW jurisdictional wetlands or riparian vegetation and are not considered shade-sensitive; permanent indirect impacts are not expected. Beneficial impacts include cooler temperatures and shelter for wildlife species under the bridge.
- Ossum Wash, Turner Wash and Bell Mountain Wash are expected to have clear-span bridge structures, requiring no fill or equipment access in the streambeds. Permanent impacts will include several footings, pilings, vegetation clearing and equipment access limited to the top of the banks.

These washes do not have CDFW jurisdictional wetlands or riparian vegetation.

- Grandview Canyon Creek, Graham Canyon Creek, Mescal Creek, Sheep Creek, Fremont Wash, contributing unnamed washes and several isolated unnamed washes are expected to have box culverts to maintain hydrologic integrity and support wildlife movement. These concrete box culverts will be further analyzed during final design phases with proposals for full-span or non-embedded culverts above the bed, bank and channels to avoid permanent direct impacts to the extent feasible. Beneficial impacts include cooler temperatures and shelter within the box culverts for wildlife species and their movement. Numerous isolated unnamed washes are expected to have reinforced concrete pipe culverts to maintain hydrologic integrity and support small wildlife movement. These reinforced concrete pipe culverts will be further analyzed during final design phases with proposals for non-embedded culverts above the bed, bank and channels to avoid permanent direct impacts to the extent feasible. Beneficial impacts include cooler temperatures and shelter within the pipe culverts for wildlife species and their movement.
- Numerous washes that contribute to Fremont Wash within Variation E are expected to have full-span or non-embedded culverts above the OHWM to avoid permanent impacts to the extent feasible. Beneficial impacts include cooler temperatures and shelter within the box culverts for wildlife species and their movement.
- Any work within the ephemeral washes will be conducted when there is no flow during the dry season (May 1-October 15).
- Temporary construction staging areas and unpaved access roads will be strategically placed to avoid and/or minimize impacts to CDFW jurisdictional features to the extent feasible and are expected to be restored to pre-project conditions, through landscape restoration and the use of geotech fabric under roads to identify the previous grade and to maintain the topsoil.

4.5.2.3. SWRCB JURISDICTION

4.5.6.3.1. All Alternatives/Variations/Options

Avoidance and minimization measures for SWRCB jurisdictional features are the same as the USACE jurisdictional features and CDFW Jurisdiction for all of the alternatives, variations, and options.

4.5.3. Project Impacts for Jurisdictional Waters

An analysis of the JD and project plans indicate reduced permanent impacts to jurisdictional features with the implementation of avoidance and minimization efforts.

4.5.3.1. USACE JURISDICTION

Pursuant to the CWA, all dredge and fill activities within WUS are regulated under Section 404, by the USACE. Within the project footprint, USACE jurisdictional features are located within the Upper Fremont Wash and Bell Mountain-Mojave River 10-digit HUC sub-watersheds of all alternatives, variations and options.

4.5.7.1.1. Freeway/Expressway (Freeway/Tollway) Alternative

There are 33.81 acres within the BSA inclusive of all variations to the Freeway/Expressway (Freeway/Tollway) Alternative are considered under USACE jurisdiction.

4.5.7.1.1.1. Main Alignment/Common Areas

Permanent direct impacts to waters of the U.S. in the main alignment common areas are approximately 1.58 acres. These permanent impacts include:

- Piers, piling, or footing locations below the OHWM of several contributing unnamed washes to Bell Mountain Wash.
- Box culverts within Fremont Wash and its contributing washes. These washes do not have wetlands or riparian vegetation and are not considered shade-sensitive; permanent indirect impacts are not expected.

Temporary impacts to waters of the U.S. in the main alignment common areas are approximately 10.15 acres. These temporary impacts include equipment maneuvering and unpaved access roads surrounding the Fremont Wash and contributing washes, as well as Bell Mountain Wash and several of its contributing washes (see Table 15).

4.5.7.1.1.2. Main B

Permanent direct impacts to WUS in Main B are approximately 0.09 acres. These permanent impacts include box culverts within Fremont Wash and its contributing washes. These washes do not have wetlands or riparian vegetation and are not considered shade-sensitive; permanent indirect impacts are not expected. Temporary impacts to WUS in Main B are approximately 0.08 acres. These temporary impacts include equipment maneuvering and unpaved access roads surrounding the Fremont Wash and contributing washes (see Table 15).

4.5.7.1.1.3. Variation B

Permanent direct impacts to WUS in the Variation B alignment are approximately 0.04 acres. These permanent impacts include box culverts within Fremont Wash and its contributing washes. These washes do not have wetlands or riparian vegetation and are not considered shade-sensitive; permanent indirect impacts are not expected. Temporary impacts to WUS in the Variation B alignment are approximately 0.04 acres. These temporary impacts include equipment maneuvering and unpaved access roads surrounding the Fremont Wash and contributing washes (see Table 15).

4.5.7.1.1.4. Variation B1

Permanent direct impacts to WUS in the Variation B1 alignments are approximately 0.16 acres. These permanent impacts include box culverts within Fremont Wash and its contributing washes. These washes do not have wetlands or riparian vegetation and are not considered shade-sensitive; permanent indirect impacts are not expected. Temporary impacts to WUS in the Variation B1 alignment are approximately 0.14 acres. These temporary impacts include equipment maneuvering and unpaved access roads surrounding the Fremont Wash and contributing washes (see Table 15).

4.5.7.1.1.5. Main D and Variation D

Potential USACE jurisdictional features were not identified within the project footprint of Main D or Variation D of the Freeway/Expressway (Freeway/Tollway) Alternative.

4.5.7.1.1.6. Main E with Mojave River Bridges

Permanent direct impacts to WUS in the Main E Main alignment with the Mojave River Bridges are approximately 2.48 acres. These permanent impacts include piers, piling, or footing locations below the OHWM of several contributing unnamed washes to Turner Wash, Ossum Wash, and the Mojave River. Temporary impacts to WUS in the Main E alignment with the Mojave River Bridges are approximately 1.32 acres (see Table 15). These temporary impacts include equipment maneuvering and unpaved access roads surrounding Turner Wash, Ossum Wash, and several contributing unnamed washes to Turner Wash, Ossum Wash, and the Mojave River.

These acreage calculations resulted from additional design refinement based on public comments that included design modifications of the project alignment in the areas of Victorville.

4.5.7.1.1.7. Variation E with Mojave River Bridges

Permanent direct impacts to WUS in the Variation E alignment with the Mojave River Bridges are approximately 5.52 acres, including 0.87 acres of wetlands. These permanent impacts include piers, piling, or footing locations below the OHWM of several contributing unnamed washes to Turner Wash, Ossum Wash, and the Mojave River. Temporary impacts to WUS in the Variation E alignment with the Mojave River Bridges are approximately 9.82 acres (see Table 15). These temporary impacts include equipment maneuvering and unpaved access roads surrounding Turner Wash, Ossum Wash, and several contributing unnamed washes to Fremont Wash, Turner Wash, Ossum Wash, and the Mojave River.

These acreage calculations resulted from further design modifications that were based on public comments that included adding additional on-/off-ramps or moving detention basins in the areas of Victorville. These design modifications within Variation E have an extensive impact to biological resources and jurisdictional features, and this option has been eliminated as a viable variation alternative.

4.5.7.1.2. Freeway/Expressway (Freeway/Tollway) Alternative with the HSR Feeder Service

4.5.7.1.2.1. Main Alignment/Common Areas

Permanent direct impacts to WUS in the main alignment common areas are approximately 1.35 acres. These permanent impacts include box culverts within Fremont Wash and its contributing washes. These washes do not have WUS wetlands or WUS nonwetland riparian vegetation and are not considered shade-sensitive; permanent indirect impacts are not expected. Temporary impacts to WUS in the main alignment common areas are approximately 7.88 acres (see Table 15). These temporary impacts include equipment maneuvering and unpaved access roads surrounding Fremont Wash and its contributing washes.

4.5.7.1.2.2. Rail Options 1A, 1B, 1C, 7A, 7B, 7C, Main D, and Variation D

Potential USACE jurisdictional features were not identified within the Rail Options 1A, 1B, 1C, 7A, 7B, 7C, Main D, or Variation D of the Freeway/Expressway (Freeway/Tollway) Alternative with the HSR Feeder Service.

4.5.7.1.2.3. Main B

Permanent direct impacts to WUS in the Main B, alignment are approximately 0.14 acres. These permanent impacts include box culverts within Fremont Wash and its contributing washes. These washes do not have wetlands or riparian vegetation and are not considered shade-sensitive; permanent indirect impacts are not expected. Temporary impacts to WUS in the Main B are approximately 0.04 acres (see Table

15). These temporary impacts include equipment maneuvering and unpaved access roads surrounding the Fremont Wash and contributing washes.

4.5.7.1.2.4. Variation B

Permanent direct impacts to WUS in the Variation B alignment are approximately 0.11 acres. These permanent impacts include box culverts within Fremont Wash and its contributing washes. These washes do not have wetlands or riparian vegetation and are not considered shade-sensitive; permanent indirect impacts are not expected. Temporary impacts to WUS within Variation B are approximately 0.04 acres (see Table 15). These temporary impacts include equipment maneuvering and unpaved access roads surrounding the Fremont Wash and contributing washes.

4.5.7.1.2.5. Variation B1

Permanent direct impacts to WUS within the Variation B1 alignment are approximately 0.25 acres. These permanent impacts include box culverts within Fremont Wash and its contributing washes. These washes do not have wetlands or riparian vegetation and are not considered shade-sensitive; permanent indirect impacts are not expected. Temporary impacts to WUS in Variation B1 are approximately 0.05 acres (see Table 15). These temporary impacts include equipment maneuvering and unpaved access roads surrounding the Fremont Wash and contributing washes.

4.5.7.1.2.6. Main E with HSR Feeder Service and with Mojave River Bridges

Permanent direct impacts to WUS in the Main E with HSR Feeder Service alignment are approximately 3.24 acres. These permanent impacts include:

- Piers, piling, or footing locations below the OHWM of several contributing unnamed washes to Turner Wash, Ossum Wash, and the Mojave River.
- Piers, piling, or footing locations within WUS non-wetland riparian vegetation of the Mojave River.

Temporary impacts to WUS in the Main E alignment are approximately 7.26 acres (see Table 15). These temporary impacts include equipment maneuvering and unpaved access roads surrounding Turner Wash, Ossum Wash, and several contributing unnamed washes to Turner Wash, Ossum Wash, and the Mojave River.

4.5.7.1.2.7. Variation E with HSR Feeder Service with Mojave River Bridges

Permanent direct impacts to WUS in Variation E with HSR Feeder Service are approximately 18.68 acres. These permanent impacts include:

- Piers, piling, or footing locations below the OHWM of the Mojave River and several contributing unnamed washes to Turner Wash, Ossum Wash, and the Mojave River.

- Piers, piling, or footing locations within waters of the U.S. nonwetland riparian vegetation of the Mojave River.

Temporary impacts to WUS in Variation E with HSR Feeder Service are approximately 9.67 acres. These temporary impacts include equipment maneuvering and unpaved access roads within the Mojave River and surrounding Turner Wash, Ossum Wash, and several contributing unnamed washes to Turner Wash, Ossum Wash, and the Mojave River.

An analysis of the JD and project plans indicate reduced permanent impacts to jurisdictional features with the implementation of avoidance and minimization efforts.

4.5.7.1.3. Summary of USACE Jurisdiction

With the implementation of avoidance and minimization measures, incorporation of design modifications requested during public comments, and several options that were eliminated permanent impacts to no more than 7.26 acres of WUS and temporary impacts to no more than 20.11 acres of WUS (see Table 15) are anticipated within the proposed Freeway/Expressway (Freeway/Tollway) Alternative along the longest/widest variations.

With the implementation of avoidance and minimization measures, incorporation of design modifications requested during public comments, and several options that were eliminated permanent impacts to no more than 4.84 acres of WUS and temporary impacts to no more than 15.19 acres of WUS are anticipated within the Freeway/Expressway (Freeway/Tollway) with HSR Feeder Service along the widest variations (see Table 15) (Preferred Alternative).

These acreage conclusions represent a calculated estimation of the jurisdictional areas within the project impact area, and are subject to modification following the USACE verification process.

Table 15: Impacts to USACE Jurisdictional Features for the High Desert Corridor Project (acres)

Project Component	Non-wetland Waters of the U.S.		Wetland Waters of the U.S.		Total Waters of the U.S.	
	Temporary Impacts	Permanent Impacts	Temporary Impacts	Permanent Impacts	Temporary Impacts	Permanent Impacts
	Equipment and Access Roads	*Fill*	*Equipment and Access Roads*	*Fill*	*Equipment and Access Roads*	*Fill*
Freeway/Expressway (Freeway/Tollway) Alternative						
Total Main Alignment/ Common Areas (acres)	10.15	1.58	0.00	0.00	10.15	1.58
Total Variation B Main (acres)	0.08	0.09	0.00	0.00	0.08	0.09
Total Variation B (acres)	0.04	0.04	0.00	0.00	0.04	0.04
Total Variation B1 (acres)	0.14	0.16	0.00	0.00	0.14	0.16
Total Variation E Main with Mojave River Bridges (acres)	1.32	2.48	0.001	0.000	1.32	2.48
Total Variation E with Mojave River Bridges (acres)	8.50	4.65	1.32	0.87	9.82	5.52
Freeway/Expressway (Freeway/Tollway) Alternative with HSR Feeder Service						
Total Main Alignment/Common Areas (acres)	7.88	1.35	0.00	0.00	7.88	1.35
Total Variation B Main (acres)	0.04	0.14	0.00	0.00	0.04	0.14
Total Variation B (acres)	0.04	0.11	0.00	0.00	0.04	0.11
Total Variation B1 (acres)	0.05	0.25	0.00	0.00	0.05	0.25
Total Variation E Main with HSR Feeder Service with Mojave River Bridges (acres)	7.26	3.24	0.00	0.00	7.26	3.24
Total Variation E with HSR Feeder Service with Mojave River Bridges (acres)	8.94	15.69	0.73	2.99	9.67	18.68

4.5.3.2. CDFW JURISDICTION

Pursuant to Fish and Game Code Section 1600-1603, impacts to features regulated by CDFW include USACE and SWRCB jurisdictional features as “streambeds” plus any riparian habitat associated with the regulated streambeds.

The following subsections summarize the impacts to CDFW jurisdictional waters by alternatives.

4.5.7.2.1. Freeway/Expressway (Freeway/Tollway) Alternative

4.5.7.2.1.1. Main Alignment/Common Areas

Ephemeral washes located in the main alignment common areas are located within the following 10-digit HUC subwatersheds: Bell Mountain-Mojave River, Amargosa Creek, Lake Palmdale-Piute Ponds, Little Rock Wash, Town of Pearblossom, Rock Creek-Buckhorn Lake, Big Rock Creek-Big Rock Wash, Le Montaine Creek-Eller Slough, Mescal Creek-Rocky Buttes, Lower Fremont Wash, Upper Fremont Wash, and Apple Valley Dry Lake.

Permanent direct impacts to CDFW jurisdictional features in the Main Alignment common areas are approximately 18.79 acres (see Table 16). These permanent direct impacts include:

- Box culverts and desert scrub vegetation clearing limited to the top of the banks of Grandview Canyon Creek, Graham Canyon Creek, Mescal Creek, Sheep Creek, Fremont Wash, contributing washes, and numerous isolated unnamed washes.

- Piers, pilings, footings, and desert scrub vegetation clearing within the streambeds of Little Rock Wash. Piers, piling, or footing locations within CDFW jurisdictional areas of Big Rock Wash.

Temporary impacts to CDFW jurisdictional features in the Main Alignment common areas are approximately 31.48 acres (see Table 16). These temporary impacts include equipment maneuvering and unpaved access roads within the Little Rock Wash, Big Rock Wash, Grandview Canyon Creek, Graham Canyon Creek, Mescal Creek, Sheep Creek, Fremont Wash, contributing washes, and numerous isolated unnamed washes.

4.5.7.2.1.2 Main A

The following ephemeral washes within the Main A alignment are located within the 10 digit HUC subwatersheds: Lake Palmdale-Piute Ponds; Amargosa Creek; and Little Rock Wash.

Permanent direct impacts to CDFW jurisdictional features in the Main A alignment are approximately 5.66 acres (see Table 16). These permanent direct impacts include:

- Box culverts and desert scrub vegetation clearing within several isolated unnamed washes.
- Piers, pilings, footings, and desert scrub vegetation clearing within the streambeds of Little Rock Wash.

Temporary impacts to CDFW jurisdictional features in the Main A alignment are approximately 0.76 acre (see Table 16). These temporary impacts include equipment maneuvering and unpaved access roads within Little Rock Wash and several isolated unnamed washes.

4.5.7.2.1.3 Variation A

The following ephemeral washes within the Variation A alignment are located within the 10 digit HUC subwatersheds: Lake Palmdale-Piute Ponds; Amargosa Creek; and Little Rock Wash.

Permanent direct impacts to CDFW jurisdictional features in the Variation A alignment are approximately 10.76 acres (see Table 16). These permanent direct impacts include:

- Box culverts and desert scrub vegetation clearing within several isolated unnamed washes.
- Piers, pilings, footings, and desert scrub vegetation clearing within the streambeds of Little Rock Wash.

Temporary impacts to CDFW jurisdictional features in the Variation A alignment are approximately 6.36 acre (see Table 16). These temporary impacts include equipment maneuvering and unpaved access roads within Little Rock Wash and several isolated unnamed washes.

4.5.7.2.1.4 Main B

The following ephemeral washes within the Main B alignment are located within the 10-digit HUC subwatersheds: Sheep Creek-El Mirage Lake; Le Montaine Creek-Eller Slough; and Lower Fremont Wash.

Permanent direct impacts to CDFW jurisdictional features in the Main B alignment are approximately 0.67 acres (see Table 16). These permanent direct impacts

include box culverts and desert scrub vegetation clearing within Sheep Creek, Fremont Wash, contributing washes, and several isolated unnamed washes

Temporary impacts to CDFW jurisdictional features in the Main B alignment are approximately 0.60 acres, within Sheep Creek, Fremont Wash, an unnamed tributary to Fremont Wash, and several isolated unnamed washes (see Table 16).

4.5.7.2.1.5. Variation B

The following ephemeral washes within the Variation B alignment are located within the 10-digit HUC subwatersheds: Sheep Creek-El Mirage Lake; Le Montaine Creek-Eller Slough; and Lower Fremont Wash.

Permanent direct impacts to CDFW jurisdictional features in the Variation B alignment are approximately 0.66 acres (see Table 16). These permanent direct impacts include box culverts and desert scrub vegetation clearing within Sheep Creek, Fremont Wash, contributing washes, and several isolated unnamed washes

Temporary impacts to CDFW jurisdictional features in the Variation B alignment are approximately 0.45 acres, within Sheep Creek, Fremont Wash, an unnamed tributary to Fremont Wash, and several isolated unnamed washes (see Table 16).

4.5.7.2.1.6. Variation B1

The following ephemeral washes within the Variation B1 alignment are located within the 10-digit HUC subwatersheds: Sheep Creek-El Mirage Lake; Le Montaine Creek-Eller Slough; and Lower Fremont Wash.

Permanent direct impacts to CDFW jurisdictional features in the Variation B1 alignment are approximately 0.91 acres (see Table 16). These permanent direct impacts include box culverts and desert scrub vegetation clearing within Sheep Creek, Fremont Wash, contributing washes, and several isolated unnamed washes

Temporary impacts to CDFW jurisdictional features in the Variation B1 alignment are approximately 0.75 acres, within Sheep Creek, Fremont Wash, an unnamed tributary to Fremont Wash, and several isolated unnamed washes (see Table 16).

4.5.7.2.1.7. Main D

The following ephemeral washes located within the Main D alignment are located within the 10-digit HUC subwatersheds: Le Montaine Creek-Eller Slough; and Mescal Creek-Rocky Buttes

Permanent direct impacts to CDFW jurisdictional features in the Main D alignment are approximately 2.77 acres (see Table 16).

Temporary impacts to CDFW jurisdiction features in the Main D alignment are approximately 0.86 acres (see Table 16). These temporary impacts include equipment maneuvering and unpaved access roads within Mescal Creek and several isolated unnamed washes.

4.5.7.2.1.8. Variation D

The following ephemeral washes located within the Variation D alignment are located within the 10-digit HUC subwatersheds: Le Montaine Creek-Eller Slough; and Mescal Creek-Rocky Buttes.

Permanent direct impacts to CDFW jurisdictional features in the Variation D alignment are approximately 0.89 acres (see Table 16).

Temporary impacts to CDFW jurisdiction features in the Variation D alignment are approximately 1.04 acres (see Table 16). These temporary impacts include equipment maneuvering and unpaved access roads within Mescal Creek and several isolated unnamed washes.

4.5.7.2.1.8. Main E with Mojave River Bridges

The following ephemeral washes located within Main E are located within the 10-digit HUC subwatersheds: Bell Mountain-Mojave River; Upper Fremont Wash; and Lower Fremont Wash.

Permanent direct impacts to CDFW jurisdictional features in the Main E alignment are approximately 4.10 acres (see Table 16). These permanent impacts include:

- Piers, pilings, footings, and desert scrub vegetation clearing limited to the top of the banks of Turner Wash, Ossum Wash, and several contributing unnamed washes to Turner Wash, Ossum Wash, and the Mojave River.
- Piers, piling, or footing locations within CDFW jurisdictional areas of the Mojave River.

Temporary impacts to CDFW jurisdictional features in the Main E alignment are approximately 6.28 acres (see Table 16). These temporary impacts include equipment maneuvering and unpaved access roads within the Mojave River and surrounding Turner Wash, Ossum Wash, and several contributing unnamed washes to Fremont Wash, Turner Wash, Ossum Wash, and the Mojave River.

4.5.7.2.1.9. Variation E with Mojave River Bridges

The following ephemeral washes located within Variation E are located within the 10-digit HUC subwatersheds: Bell Mountain-Mojave River; Upper Fremont Wash; and Lower Fremont Wash.

Permanent direct impacts to CDFW jurisdictional features in the Variation E alignment are approximately 6.56 acres. These permanent impacts include:

- Piers, pilings, footings, and desert scrub vegetation clearing limited to the top of the banks of Turner Wash, Ossum Wash, and several contributing unnamed washes to Turner Wash, Ossum Wash, and the Mojave River.
- Piers, piling, or footing locations within CDFW jurisdictional areas of the Mojave River.

Temporary impacts to CDFW jurisdictional features in the Main E alignment are approximately 11.15 acres. These temporary impacts include equipment maneuvering and unpaved access roads within the Mojave River and surrounding Turner Wash, Ossum Wash, and several contributing unnamed washes to Fremont Wash, Turner Wash, Ossum Wash, and the Mojave River.

These acreage calculations resulted from further design modifications that were based on public comments that included adding additional on-/off-ramps or moving detention basins in the areas of Victorville. These design modifications within Variation E have an extensive impact to biological resources and jurisdictional features, and this option has been eliminated as a viable variation alternative.

4.5.7.2.2. Freeway/Expressway (Freeway/Tollway) Alternative with the HSR Feeder Service

4.5.7.2.2.1. Main Alignment/Common Areas

Permanent direct impacts to CDFW jurisdictional features in the Main Alignment common areas are approximately 25.06 acres (see Table 16). These permanent direct impacts include:

- Piers, pilings, footings, and desert scrub vegetation clearing limited to the top of the banks of several isolated unnamed washes.
- Piers, piling, or footing locations within CDFW-regulated streambeds or associated riparian habitat of Big Rock Wash.

Temporary impacts to CDFW jurisdictional features in the Main Alignment common areas are approximately 31.86 acres (see Table 16). These temporary impacts include equipment maneuvering and unpaved access roads within several isolated unnamed washes.

4.5.7.2.2.2. Rail Option 1A, 1B, and 1C

The 10 digit HUC subwatershed within the Rail Options 1A, 1B, and 1C footprint include ephemeral Amargosa Creek. Permanent impacts of 1.42 acres and temporary impacts of 0.61 acre are anticipated to CDFW jurisdictional features in Rail Option 1A. Permanent impacts of 1.70 acres and temporary impacts of 0.58 acre are anticipated to CDFW jurisdictional features in Rail Option 1B. There are no permanent impacts within Rail Option 1C, and there are temporary impacts of 0.10 acres anticipated to CDFW jurisdictional features in Rail Option 1C (see Table 10). These permanent direct impacts include:

- Piers, pilings, footings, and desert scrub vegetation clearing limited to the top of the banks of several isolated unnamed washes.
- Piers, piling, or footing locations within CDFW-regulated streambeds or associated riparian habitat of Big Rock Wash.

Temporary impacts include equipment maneuvering and unpaved access roads within several isolated unnamed washes.

4.5.7.2.2.5. Rail Option 7A, 7B, and 7C

The 10 digit HUC subwatershed within the Rail Options 7A, 7B, and 7C footprint include ephemeral Amargosa Creek and Lake Palmdale-Piute Ponds. Permanent impacts of 1.21 acres and temporary impacts of 0.50 acre are anticipated to CDFW jurisdictional features in Rail Option 7A. Permanent impacts of 1.97 acres and temporary impacts of 0.54 acres are anticipated to CDFW jurisdictional features in Rail Option 7B. Permanent impacts of 0.28 acre and temporary impacts of 0.17 acres are anticipated to CDFW jurisdictional features in Rail Option 7C (see Table 16). These permanent direct impacts include:

- Piers, pilings, footings, and desert scrub vegetation clearing limited to the top of the banks of several isolated unnamed washes.

Temporary impacts include equipment maneuvering and unpaved access roads within several isolated unnamed washes.

4.5.7.2.2.8. Main B

The following ephemeral washes within the Main B alignment are located within the 10-digit HUC subwatersheds: Sheep Creek-El Mirage Lake; Le Montaine Creek-Eller Slough; and Lower Fremont Wash.

Permanent direct impacts to CDFW jurisdictional features in the Main B alignment are approximately 1.51 acres (see Table 16). These permanent direct impacts include box culverts and desert scrub vegetation clearing within Sheep Creek, Fremont Wash, an unnamed tributary to Fremont Wash, and several isolated unnamed washes

Temporary impacts to CDFW jurisdictional features in the Main B alignment are approximately 0.57 acres (see Table 16). These temporary impacts include equipment maneuvering and unpaved access roads within Sheep Creek, Fremont Wash, contributing unnamed washes, and several isolated unnamed washes.

4.5.7.2.2.9. Variation B

The following ephemeral washes within the Variation B alignment are located within the 10-digit HUC subwatersheds: Sheep Creek-El Mirage Lake; Le Montaine Creek-Eller Slough; and Lower Fremont Wash.

Permanent direct impacts to CDFW jurisdictional features in Variation B are approximately 1.39 acres (see Table 16). These permanent direct impacts include box culverts and desert scrub vegetation clearing within Sheep Creek, Fremont Wash, an unnamed tributary to Fremont Wash, and several isolated unnamed washes

Temporary impacts to CDFW jurisdictional features in Variation B are approximately 0.42 acres (see Table 16). These temporary impacts include equipment maneuvering and unpaved access roads within Sheep Creek, Fremont Wash, contributing unnamed washes, and several isolated unnamed washes.

4.5.7.2.2.10. Variation B1

The following ephemeral washes within the Variation B1 alignment are located within the 10-digit HUC subwatersheds: Sheep Creek-El Mirage Lake; Le Montaine Creek-Eller Slough; and Lower Fremont Wash.

Permanent direct impacts to CDFW jurisdictional features in Variation B1 are approximately 2.11 acres (see Table 16). These permanent direct impacts include box culverts and desert scrub vegetation clearing within Sheep Creek, Fremont

Wash, an unnamed tributary to Fremont Wash, and several isolated unnamed washes

Temporary impacts to CDFW jurisdictional features in the Variation B1 alignments are approximately 0.47 acre (see Table 16). These temporary impacts include equipment maneuvering and unpaved access roads within Sheep Creek, Fremont Wash, contributing unnamed washes, and several isolated unnamed washes.

4.5.7.2.2.11. Main D

Ephemeral washes located in the Main D are located within the following 10 digit HUC sub-watersheds: Le Montaine Creek-Eller Slough; and Mescal Creek-Rocky Buttes.

Permanent direct impacts to CDFW jurisdictional features in the Main D are approximately 3.50 acres (see Table 16). These permanent direct impacts include:

- Box culverts and desert scrub vegetation clearing within Mescal Creek and several isolated unnamed washes

Temporary impacts to CDFW jurisdictional features in the Main D are approximately 0.38 acres (see Table 16). These temporary impacts include: equipment maneuvering and unpaved access roads within Mescal Creek and several isolated unnamed washes.

4.5.7.2.2.12. Variation D

Ephemeral washes located in the Variation D are located within the following 10 digit HUC sub-watersheds: Le Montaine Creek-Eller Slough; and Mescal Creek-Rocky Buttes.

Permanent direct impacts to CDFW jurisdictional features in the Variation D are approximately 1.94 acres (see Table 16). These permanent direct impacts include:

- Box culverts and desert scrub vegetation clearing within Mescal Creek and several isolated unnamed washes

Temporary impacts to CDFW jurisdictional features in the Variation D are approximately 0.15 acres (see Table 16). These temporary impacts include: equipment maneuvering and unpaved access roads within Mescal Creek and several isolated unnamed washes.

4.5.7.2.2.13. Main E with HSR Feeder Service And with Mojave River Bridges

The following ephemeral washes within the Main E alignment are located within the 10-digit HUC subwatershed: Bell Mountain-Mojave River; Upper Fremont Wash; and Lower Fremont Wash

Permanent impacts to CDFW jurisdictional features in the Main E are approximately 5.69 acres (see Table 16). These permanent impacts include:

- Piers, piling, or footing locations below the banks of several contributing unnamed washes to Turner Wash, Ossum Wash, and the Mojave River.
- Indirect impacts will be due to bridge shading from the Mojave River clear-span bridges over riparian vegetation. Staging and equipment access will occur above banks.

Temporary impacts to CDFW jurisdictional features in the Main E are approximately 12.34 acres. These temporary impacts include equipment maneuvering and unpaved access roads surrounding Turner Wash, Ossum Wash, and several contributing unnamed washes to Fremont Wash, Turner Wash, Ossum Wash, and the Mojave River.

4.5.7.2.2.14. Variation E with HSR Feeder Service with Mojave River Bridges

The following ephemeral washes within the Variation E alignement are located within the 10-digit HUC subwatershed: Bell Mountain-Mojave River; Upper Fremont Wash; and Lower Fremont Wash

Permanent impacts to CDFW jurisdictional features in the Variation E alignment are approximately 20.49 acres (see Table 16). These permanent impacts include:

- Piers, piling, or footing locations below the banks of several contributing unnamed washes to Turner Wash, Ossum Wash, and the Mojave River.
- Staging and equipment access will occur above banks.

Temporary impacts to CDFW jurisdictional features in the Variation E are approximately 11.41 acres (see Table 16). These temporary impacts include equipment maneuvering and unpaved access roads surrounding Turner Wash, Ossum Wash, and several contributing unnamed washes to Fremont Wash, Turner Wash, Ossum Wash, and the Mojave River.

4.5.7.2.3. Summary of CDFW Jurisdiction

With the implementation of avoidance and minimization measures, incorporation of design modifications requested during public comments, and several options that were eliminated, permanent impacts to no more than 39.79 acres of CDFW jurisdictional features and temporary impacts to no more than 50.60 acres of CDFW jurisdictional features are anticipated within the proposed Freeway/Expressway (Freeway/Tollway) Alternative along the longest/widest variations (see Table 16).

With the implementation of avoidance and minimization measures, incorporation of design modifications requested during public comments, and several options that were eliminated, permanent impacts to no more than 41.47 acres of CDFW jurisdictional features and temporary impacts to no more than 46.12 acres of CDFW jurisdictional features are anticipated within the Freeway/ Expressway (Freeway/Tollway) with HSR Feeder Service (Preferred Alternative) (see Table 16).

Rail Option 1C and Rail Option 7C have the least impacts to CDFW jurisdictional features compared to Rail Option 1A, Option 1B, Option 7A, and Option 7B of the Freeway/Expressway (Freeway/Tollway) with HSR Feeder Service.

Coordination with CDFW will be required to confirm jurisdictional features and obtain a 1602 Streambed Alteration Agreement.

Table 16: Impacts to CDFW Jurisdictional Features for the High Desert Corridor Project (acres)

Project Component	CDFW Jurisdictional Ephemeral Washes		CDFW Riparian		Total	
	Temporary Impacts	Permanent Impacts	Temporary Impacts	Permanent Impacts	Temporary Impacts	Permanent Impacts
	Equipment and Access Roads	*Fill*	*Equipment and Access Roads*	*Fill*	*Equipment and Access Roads*	*Fill*
Freeway/Expressway (Freeway/Tollway) Alternative						
Total Main Alignment/Common Areas (acres)	31.30	18.79	0.18	0.00	31.48	18.79
Total Variation A Main (acres)	0.69	5.32	0.07	0.34	0.76	5.66
Total Variation A (acres)	6.35	10.74	0.01	0.02	6.36	10.76
Total Variation B Main (acres)	0.56	0.60	0.04	0.06	0.60	0.67
Total Variation B (acres)	0.40	0.60	0.05	0.06	0.45	0.66
Total Variation B1 (acres)	0.71	0.85	0.04	0.06	0.75	0.91
Total Variation D Main (acres)	0.86	2.77	0.00	0.00	0.86	2.77
Total Variation D (acres)	1.04	0.89	0.00	0.00	1.04	0.89
Total Variation E Main with Mojave River Bridges (acres)	1.32	2.51	4.96	1.59	6.28	4.10
Total Variation E with Mojave River Bridges (acres)	10.34	5.55	0.81	1.01	11.15	6.56
Freeway/Expressway (Freeway/Tollway) Alternative with the HSR Feeder Service						
Total Main Alignment/Common Areas (acres)	31.67	25.06	0.18	0.00	31.86	25.06
Total Variation A Main (acres)	1.17	6.07	0.02	0.60	1.19	6.67
Total Option 1A (acres)	0.61	1.42	0.00	0.00	0.61	1.42
Total Option 1B (acres)	0.58	1.70	0.00	0.00	0.58	1.70
Total Option 1C (acres)	0.10	0.00	0.00	0.00	0.10	0.00
Total Option 7A (acres)	0.50	1.21	0.00	0.00	0.50	1.21
Total Option 7B (acres)	0.54	1.97	0.00	0.00	0.54	1.97
Total Option 7C (acres)	0.17	0.28	0.00	0.00	0.17	0.28
Total Variation B Main (acres)	0.56	1.42	0.01	0.09	0.57	1.51
Total Variation B (acres)	0.41	1.31	0.01	0.09	0.42	1.39
Total Variation B1 (acres)	0.46	2.02	0.01	0.09	0.47	2.11
Total Variation D Main (acres)	0.38	3.50	0.00	0.00	0.38	3.50

Project Component	CDFW Jurisdictional Ephemeral Washes		CDFW Riparian		Total	
	Temporary Impacts	Permanent Impacts	Temporary Impacts	Permanent Impacts	Temporary Impacts	Permanent Impacts
	Equipment and Access Roads	*Fill*	*Equipment and Access Roads*	*Fill*	*Equipment and Access Roads*	*Fill*
Total Variation D (acres)	0.15	1.94	0.00	0.00	0.15	1.94
Total Variation E Main with HSR Connection with Mojave River Bridges (acres)	7.42	3.38	4.92	2.32	12.34	5.69
Total Variation E with HSR Connection wtih Mojave River Bridges (acres)	10.89	18.02	0.52	2.48	11.41	20.49

4.5.3.3. SWRCB JURISDICTION

Pursuant to the CWA, all dredge and fill activities regulated under Section 404, are required to obtain a 401 Water Quality Certification from the State Water Resources Control Board (SWRCB). Typically, Waters of the State of California (WSC), as regulated under Section 401 of the CWA, reflect those waters that fall under USACE jurisdiction. The SWRCB is ultimately responsible for determining SWRCB WSC pursuant to Section 401 of the CWA and the Porter-Cologne Act.

4.5.7.3.1. All Alternatives/Variations/Options

Within the project footprint for all of the alternatives, variations, and options, impacts to features regulated by SWRCB include USACE jurisdictional features under CWA Section 401 and isolated features in closed watershed areas that are subject to regulation under the Porter-Cologne Act. SWRCB jurisdictional features are referred to collectively as “waters of the State”. The Mojave River, Fremont Wash, Turner Wash, Ossum Wash, Bell Mountain Wash, and contributing unnamed washes in Mojave River Watershed are considered waters of the State as are named washes and contributing un-maned tributaries in the Antelope-Fremont Valleys Watershed that drain to Rosamond Dry Lake, Buckhorn Dry Lake, and Rogers Dry Lake on Edwards Air Force Base such as Mescal Creek, Big Rock Wash, Little Rock Wash,

With the implementation of avoidance and minimization measures, incorporation of design modifications requested during public comments, and several options that were eliminated, permanent impacts to no more than 27.61 acres of SWRCB waters of the State and temporary impacts to no more than 45.96 acres of waters of the State are anticipated within the proposed Freeway/ Expressway and Freeway/Tollway alternatives along the longest/widest variations (see Table 17).

With the implementation of avoidance and minimization measures, incorporation of design modifications requested during public comments, and several options that were eliminated, permanent impacts to no more than 19.52 acres of waters of the State and temporary impacts to no more than 46.75 acres of waters of the State are anticipated within the Freeway/Expressway (Freeway/Tollway) with HSR Feeder Service (Preferred Alternative) (see Table 17).

Rail Option 1C and Rail Option 7A have the least impacts to SWRCB jurisdictional features compared to Rail Option 1A, Option 1B, Option 7B, and Option 7C of the Freeway/Expressway (Freeway/Tollway) with HSR Feeder Service.

Coordination with the SWRCB will be required to confirm waters of the State and obtain Section 401 Water Quality Certification.

Table 17: Impacts to SWRCB Jurisdictional Features for the High Desert Corridor Project (acres)

Project Component	Non-wetland Waters of the State		Wetland Waters of the State		Total Waters of the State	
	Temporary Impacts	Permanent Impacts	Temporary Impacts	Permanent Impacts	Temporary Impacts	Permanent Impacts
	Equipment and Access Roads	*Fill*	*Equipment and Access Roads*	*Fill*	*Equipment and Access Roads*	*Fill*
Freeway/Expressway (Freeway/Tollway) Alternative						
Total Main Alignment/Common Areas (acres)	28.52	10.31	0.00	0.00	28.52	10.31
Total Variation A Main (acres)	0.68	4.41	0.00	0.15	0.68	4.56
Total Variation A (acres)	6.24	9.13	0.03	0.88	6.53	10.01
Total Variation B Main (acres)	0.56	0.60	0.00	0.00	0.56	0.60
Total Variation B (acres)	0.40	0.60	0.00	0.00	0.40	0.60
Total Variation B1 (acres)	0.58	0.62	0.00	0.00	0.58	0.62
Total Variation D Main (acres)	0.37	1.11	0.00	0.00	0.37	1.11
Total Variation D (acres)	0.61	0.59	0.00	0.00	0.61	0.59
Total Variation E Main with Mojave River Bridges (acres)	1.32	2.48	0.01	0.00	1.33	2.48
Total Variation E with Mojave River Bridges (acres)	8.63	4.69	1.32	0.87	9.96	5.56
Freeway/Expressway (Freeway/Tollway) Alternative with the HSR Feeder Service						
Total Main Alignment/Common Areas (acres)	37.47	7.66	0.00	0.00	37.47	7.66
Total Variation A Main (acres)	1.16	5.15	0.01	0.15	1.17	5.30
Total Variation B Main (acres)	0.55	1.42	0.00	0.00	0.55	1.42
Total Variation B (acres)	0.40	1.31	0.00	0.00	0.40	1.31
Total Variation B1 (acres)	0.39	1.64	0.00	0.00	0.39	1.64
Total Variation D Main (acres)	0.25	1.42	0.00	0.00	0.25	1.42
Total Variation D (acres)	0.11	1.27	0.00	0.00	0.11	1.27

Project Component	Non-wetland Waters of the State		Wetland Waters of the State		Total Waters of the State	
	Temporary Impacts	Permanent Impacts	Temporary Impacts	Permanent Impacts	Temporary Impacts	Permanent Impacts
	Equipment and Access Roads	*Fill*	*Equipment and Access Roads*	*Fill*	*Equipment and Access Roads*	*Fill*
Total Variation E Main with HSR Feeder Service with Mojave River Bridges (acres)	7.26	3.24	0.00	0.13	7.26	3.37
Total Variation E with HSR Feeder Service with Mojave River Bridges (acres)	9.05	14.46	0.73	4.29	9.77	18.75
Total Option 1A (acres)	0.34	0.83	0.00	0.00	0.34	0.83
Total Option 1B (acres)	0.34	0.95	0.00	0.00	0.34	0.95
Total Option 1C (acres)	0.36	0.28	0.00	0.00	0.36	0.28
Total Option 7A (acres)	0.33	0.76	0.03	0.00	0.36	0.76
Total Option 7B (acres)	0.37	1.16	0.03	0.00	0.40	1.16
Total Option 7C (acres)	0.17	0.90	0.05	0.03	0.23	0.93

4.5.4. Compensatory Mitigation for Jurisdictional Waters

Compensatory mitigation for impacts to jurisdictional features of USACE, SWRCB, and CDFW will be determined during the permitting process with the agencies with considerations to on-site restoration, off-site mitigation, and in-lieu fees. In general, the ratios are based on the amount and quality of the permanently and directly impacted jurisdictional features of the agencies.

4.5.5. Cumulative Impacts to Jurisdictional Waters

Potential cumulative impacts associated with the proposed project include degradation of ephemeral drainages from increased recreational activities, urban human disturbance.

4.6. Wildlife Movement Study

The project site is not a part of a known larger regional wildlife movement corridor as stated in Section 3.1.3.3. Wildlife Movement/Corridors. Therefore, implementation of the proposed project with any of the alternatives or variations would not impact a known wildlife movement corridor.

Wildlife was found to use rivers, washes and ephemeral drainages as travel routes throughout the project site. Larger drainages such as Mojave River, Big Rock Wash, Littlerock Wash, Mescal Creek, and remote dirt roads were particularly used by wildlife for travel. See Wildlife Corridor Evaluations in Appendix H for details on species found and locations.

The construction of a multi-lane highway over such a long span with natural open space occurring on both sides has potential to create a barrier to wildlife movement locally, without including design features to allow for movement.

Each of the alternatives, proposed variations and the main alignment will have the same effect on wildlife movement because each crosses the same natural drainages at essentially right angles, equally. Two exceptions are Variation E that would cross the Mojave River in two locations when compared to one crossing of the Main Alignment and the alternative with the rail which would impact an area west of Highway 15 which would otherwise not be impacted. It should be noted that all crossings of the Mojave River are expected to be bridged at a relatively high elevation, which would minimize impacts.

Several wildlife movement linkages were identified in wildlife movement studies and then presented in the DEIR/EIS. The Town of Apple Valley's Draft Multispecies Habitat Conservation Plan/Natural Communities Conservation Plan was reviewed,

specifically for identification of known wildlife linkages. Several were noted, three important ones in particular: 1) Granite Mountain Corridor, 2) Northern Lucerne Wildlife Linkage, and 3) the Mojave River. The MSHCP/NCCP states that these three, “are important features of the landscape, and their preservation will benefit the region by maintaining connectivity for plant and wildlife species and helping to mitigate impacts from climate change.”

The proposed project provides for wildlife crossing at these locations and many others nearby. With the construction of the proposed free-span bridge over the Mojave River at an elevation of 80 feet or greater, it is expected that there will be no impact to wildlife movement through the Mojave Narrows reach of the river where the transit line crosses. At many locations in and near the Northern Lucerne Wildlife Linkage Corridor numerous soft-bottomed box culverts and elevated viaducts are included in the design. With the implementation of these features no impact to wildlife movement is expected.

Upon further review of the vehicle traffic that is anticipated to occur on SR-18 at the east terminus of the proposed project, there is potential for impact to wildlife crossing further east of the terminus. Although SR-18 is currently a two-lane highway with only few 18” corrugated metal culverts crossing the highway, with the anticipated quadrupling of the traffic at this point, wildlife crossing could be affected. As such, project design includes soft-bottom box culverts at the location identified as Granite Mountain Corridor designed to facilitate wildlife crossing. With the implementation of these culverts no impact is expected to occur to wildlife movement along Granite Mountain Corridor.

The design of the highway should include wildlife crossing structures that are as natural and easy for wildlife to use as feasible. Specific design features should include the following:

Where feasible, use large at-grade culverts under the new highway where natural drainages occur. Wildlife are more likely to use such crossings when “daylight” or openings to the other side are visible. Where culvert lengths need to be longer due to design, median daylights should be used.

Bridges and culverts constructed to cross drainage features should be high and wide enough to allow large wildlife to travel under the structure (Bank et al. 2002). The design should also include culverts as crossing structures that are specifically designed for wildlife travel (Penrod et al. 2012).

In response to CDFW comments during early coordination meetings, it is understood that Caltrans has since designed the culverts to be a “soft bottom”. Because it is not

feasible to bridge all 200+ natural drainages, it is understood that the smaller drainages will have a hard-bottom box culvert that is placed a minimum one foot below surrounding grade to allow soil to be placed on top of the hard bottom, thus creating a soft bottom. It is also understood that without this soft-bottom design, each culvert would essentially require a bridging design that would be cost prohibitive. It should be noted that shorter, wider, taller soft-bottom design culverts are preferred for wildlife crossings.

Also included as part of the design, culverts were expanded in size both height and width to better attract wildlife use. As a result from comments from Caltrans' Environmental Planning with input from CDFW, original design dimensions for all culverts were increased by two feet in height and one foot in width.

Table 18, shown below, identifies the proposed culvert crossings for this project. The table provides information on the number of culverts, station numbers, and descriptions of each culvert (i.e. 4 – 7' x 3' RCB = 4 reinforced concrete box barrels arranged side by side at a height of 7 feet and width of 3 feet). It is important to note that each stated height for the soft bottom culverts is the final height after 1' of sediment has been applied to the culvert to create a soft bottom. Specific locations of these culverts can be viewed in the Hydraulics Appendices.

Table 18: High Desert Corridor Wildlife Crossings

Culvert #	Station	Description	Soft Bottom
1	270+75	4 - 7' x 3' RCB	N
2	287+60	3 - 7' x 3' RCB	N
3	329+40	4 - 7' x 3' RCB	N
4	330+90	4 - 7' x 3' RCB	N
5	348+00	4 - 7' x 3' RCB	N
6	352+50	4 - 7' x 3' RCB	N
7	365+00	4 - 7' x 3' RCB	N
8	383+50	7 - 7' x 3' RCB	N
9	385+00	4 - 7' x 3' RCB	N
10	399+40	4 - 7' x 3' RCB	N
11	403+00	4 - 7' x 3' RCB	N
12	420+80	4 - 7' x 3' RCB	N
13	439+20	3 - 7' x 3' RCB	N
14	456+50	4 - 10' x 6' RCB	N
15	473+20	1 - 7' x 3' RCB	N

Culvert #	Station	Description	Soft Bottom
16	507+80	1 - 7' x 3' RCB	N
17	519+20	1 - 7' x 3' RCB	N
18	532+50	1 - 7' x 3' RCB	N
19	570+33	4 - 7' x 3' RCB	N
20	573+35	4 - 7' x 3' RCB	N
21	691+00	5 - 10' x 5' RCB	N
22	694+00	5 - 10' x 5' RCB	N
23	696+60	5 - 10' x 5' RCB	N
24	699+20	5 - 10' x 5' RCB	N
25	701+80	5 - 10' x 5' RCB	N
26	704+40	5 - 10' x 5' RCB	Y
27	707+00	5 - 10' x 5' RCB	Y
28	710+00	4 - 7' x 3' RCB	Y
29	717+00	4 - 7' x 3' RCB	N
30	722+00	4 - 7' x 3' RCB	N
31	727+50	1 - 10' x 5' RCB	Y
32	762+00	2 - 10' x 5' RCB	Y
33	771+99	5 - 7' x 3' RCB	N
34	782+00	5 - 7' x 3' RCB	Y
35	805+80	1 - 10' x 5' RCB	Y
36	850+00	1 - 10' x 5' RCB	Y
37	907+00	1 - 10' x 5' RCB	Y
38	925+00	1 - 10' x 5' RCB	Y
39	937+00	2 - 7' x 3' RCB	Y
40	970+04	3 - 7' x 3' RCB	Y
41	1019+00	1 - 7' x 3' RCB	Y
42	1052+00	1 - 10' x 5' RCB	Y
43	1072+00	1 - 10' x 5' RCB	Y
44	1099+00	1 - 7' x 3' RCB	Y
45	1115+03	1 - 10' x 5' RCB	Y
46	1150+04	2 - 8' x 6' RCB	Y
47	1162+61	3 - 10' x 8' RCB	Y
48	1172+11	3 - 10' x 8' RCB	Y
49	1180+12	2 - 8' x 6' RCB	Y

Culvert #	Station	Description	Soft Bottom
50	1191+09	3 - 8' x 6' RCB	Y
51	1196+09	3 - 8' x 6' RCB	N
52	1204+00	1 - 8' x 6' RCB	Y
53	1218+05	2 - 8' x 6' RCB	Y
54	1224+04	2 - 8' x 6' RCB	N
55	1229+05	3 - 8' x 6' RCB	Y
56	1276+00	1 - 6' x 6' RCB	Y
57	1288+00	1 - 6' x 4' RCB	Y
58	1300+00	1 - 6' x 6' RCB	Y
59	1321+00	1 - 7' x 3' RCB	Y
60	1351+00	1 - 7' x 3' RCB	Y
61	1362+05	2 - 10' x 6' RCB	N
62	1367+22	3 - 10' x 8' RCB	Y
63	1378+04	3 - 8' x 6' RCB	Y
64	1388+04	3 - 8' x 6' RCB	Y
65	1402+00	1 - 7' x 3' RCB	Y
66	1441+00	1 - 6' x 6' RCB	Y
67	1476+00	1 - 6' x 6' RCB	Y
68	1515+02	2 - 7' x 3' RCB	Y
69	1551+04	2 - 8' x 6' RCB	Y
70	1575+04	2 - 8' x 6' RCB	Y
71	1606+11	3 - 10' x 8' RCB	Y
72	1619+05	2 - 10' x 6' RCB	Y
73	1629+05	2 - 10' x 6' RCB	Y
74	1637+11	4 - 10' x 6' RCB	Y
75	1651+08	3 - 8' x 6' RCB	Y
76	1675+05	4 - 8' x 4' RCB	Y
77	1690+05	2 - 10' x 8' RCB	Y
78	1698+05	2 - 10' x 8' RCB	Y
79	1716+05	2 - 10' x 8' RCB	Y
80	1727+05	2 - 10' x 8' RCB	Y
81	1756+00	1 - 8' x 6' RCB	Y
82	1791+00	1 - 8' x 6' RCB	Y
83	1873+00	1 - 8' x 6' RCB	Y

Culvert #	Station	Description	Soft Bottom
84	1905+00	1 - 8' x 6' RCB	Y
85	1944+00	2 - 8' x 6' RCP	Y
86	1958+00	2 - 7' x 3' RCB	Y
87	1981+04	1 - 8' x 6' RCB	Y
88	2045+00	1 - 6' x 6' RCB	Y
89	2080+00	1 - 8' x 6' RCB	Y
90	2096+05	2 - 10' x 6' RCB	Y
91	2116+05	3 - 10' x 6' RCB	Y
92	2135+05	3 - 8' x 4' RCB	Y
93	2148+00	2 - 10' x 6' RCB	Y
94	2167+00	2 - 10' x 6' RCB	Y
95	2178+00	1 - 8' x 4' RCB	Y
96	2236+00	1 - 6' x 6' RCB	Y
97	2256+11	7 - 10' x 8' RCB	Y
98	2271+40	6 - 10' x 8' RCB	Y
99	2284+11	4 - 10' x 8' RCB	Y
100	2292+17	4 - 10' x 8' RCB	Y
101	2321+47	1 - 7' x 3' RCB	Y
102	2325+68	1 - 5' x 3' RCB	N
103	2331+28	1 - 8' x 6' RCB	Y
104	2349+00	1 - 7' x 3' RCB	Y
105	2414+00	1 - 8' x 6' RCB	Y
106	2465+26	5 - 8' x 6' RCB	Y
107	2472+79	5 - 8' x 6' RCB	Y
108	2562+23	1 - 7' x 3' RCB	Y
109	2792+17	9 - 12' x 8' RCB	Y
110	2899+09	5 - 10' x 5' RCB	Y
111	3036+14	3 - 10' x 5' RCB	Y
112	3051+70	2 - 10' x 6' RCB	Y
113	3111+69	4 - 7' x 3' RCB	N
114	3138+26	4 - 7' x 3' RCB	Y
115	3149+59	4 - 7' x 3' RCB	Y
116	3163+47	4 - 7' x 3' RCB	Y
117	3180+89	4 - 7' x 3' RCB	Y

Culvert #	Station	Description	Soft Bottom
118	3190+27	4 - 7' x 3' RCB	Y
119	3197+82	4 - 7' x 3' RCB	N
120	3207+17	4 - 7' x 3' RCB	N
121	3224+32	4 - 7' x 3' RCB	N
122	3240+97	4 - 7' x 3' RCB	Y
123	3260+40	4 - 7' x 3' RCB	Y
124	3271+71	4 - 7' x 3' RCB	Y
125	3285+51	3 - 7' x 3' RCB	Y
126	3296+99	3 - 7' x 3' RCB	Y
127	3314+16	3 - 7' x 3' RCB	Y
128	3327+31	3 - 7' x 3' RCB	Y
129	3333+51	3 - 7' x 3' RCB	Y
130	3393+17	3 - 7' x 3' RCB	Y
131	3423+54	3 - 7' x 3' RCB	Y
132	3450+74	3 - 7' x 3' RCB	Y

4.7. Raptor Hunting Habitat

Various species of raptors are known to occur within the vicinity of the proposed project site and several were observed during site visits. Of particular note an active golden eagle nest was observed just outside the project limits on the upper most, steep section of Bell Mountain. Although the implementation of the proposed project is not expected to directly take an individual raptor, as adults are mobile and expected to fly away and active nests are protected, implementation of the proposed project would convert substantial raptor hunting habitat to unsuitable hunting habitat. Because such habitat is synonymous with natural desert scrub, enhancement/restoration, and preservation of such natural plant community as stated in Mitigation Measure 3 of Table 6 will reduce these impacts. As such, the implementation of Mitigation Measure 3 of Table 6 would reduce impacts from the conversion of raptor hunting habitat to unsuitable habitat to a less than substantial level.

4.8. Green Energy Facility

Impacts resulting from installation of photovoltaic solar panels:[BF15]

This proposed multi-modal transportation project also proposes to construct photovoltaic solar panels in various areas along the route. These panels would be installed within Caltrans' right-of-way in areas where possible, which, due to various constraints, would total no more than 20 linear miles along the proposed route at a 100 ft width and no more than 242 total acres. Because exact location has not yet been determined, impact analysis is challenging for some biological topics.

Total impacts to natural plant communities could be up to 242 acres. As stated above, exact location is not yet known. Therefore, impact amounts to individual plant communities cannot be calculated. It is suggested that special-status natural plant communities and jurisdictional drainages be avoided and that panels be installed in areas that are considered disturbed (greater than 50% non-native plants) or already developed in some manner. At the time of this writing it is understood that these sensitive areas would be avoided and are one of the limiting factors restricting installation to no more than 20 linear miles. Therefore, it is expected that no impacts would occur to special-status plant communities or jurisdictional drainages as a result of construction of the photovoltaic element of this project.

4.9. Indirect Impacts

Indirect impacts on biological resources would occur to those natural habitats in surrounding areas immediately adjacent to the proposed project limits, after the completion of the proposed project. Any one of these topics or combination of two or more can be referred to as an "edge effect". It is expected that implementation of the proposed project would result in indirect impacts to biological resources in the following ways:

- Increased light and glare
- Increased noise
- Vibration
- Increase in populations of non-native plants
- Increase in vehicle/wildlife collisions and kills
- Growth inducement – increase in human presence and development

Indirect impacts associated with the proposed project are not quantifiable but are reasonably foreseeable. As such, the discussion that follows provides a common-sense identification of the types of secondary impacts and their relative magnitude.

Shadowing effects from where the alignment crosses the Mojave River was determined to not have an indirect impact on riparian vegetation directly below, and the rational for this conclusion is discussed further in section 4.9.7.

4.9.1. Light and Glare

Development of the site has the potential to increase the nighttime light and glare sources on the site when compared to current levels. In particular, areas most sensitive to increased lighting and glare over natural conditions would be the rivers, washes, and drainages, which provide for a natural pathway for wildlife. It appears that lighting fixtures installed at these natural features would cast light into them.

Nighttime illumination is known to adversely affect some species of wildlife in natural areas. It can disturb breeding and foraging behavior and potentially alter breeding cycles of birds, mammals, and nocturnal invertebrates. In addition, light could deter some animal species, especially the lager mammals, from using rivers, creeks, and washes as a movement corridor. If uncontrolled, such lighting where proximal to these movement corridors, could adversely impact the composition and behavior of the wildlife that occur in these areas. This impact is considered potentially substantial. With the implementation of the proposed mitigation measures stated below, the level of impacts to wildlife due to lighting and glare would be less than substantial.

It appears there is no appreciable difference in impacts to wildlife due to lighting between the alternatives or among any of the variations or options.

Mitigation measures:[BF16]

1. Use lighting in areas only where necessary for safety and signage. Eliminate all lighting in other areas.

2. All lighting should be downcast to minimize lighting of natural areas, particularly rivers, washes and drainages.

4.9.2. Noise

It is understood that operating noise from the proposed rail would be 65 dBA at a distance of about 300 feet and it is estimated that temporary noise levels during construction would be at 65 dBA to 400 feet from any point source. U.S. Fish and Wildlife Service typically uses 65 dBA as the threshold at which nesting birds have been observed to be affected. Therefore, it is expected that activities of noise-sensitive wildlife would be impacted by noise levels up to 400 feet temporarily and up to 300 feet during regular operation for all alternatives including high speed rail. Because construction of the rail line would occur in phases along the route and would be temporarily in nature, impacts from construction on wildlife are expected to be less than substantial. Similarly to construction impacts normal operation of the HSR would be temporary in nature and limited only to those instances when trains

are passing any given point. Based on given average train trips, impacts from normal operation of the HSR on wildlife are expected to be less than substantial

It is expected that the use of the Freeway/Expressway (Freeway/Tollway) would increase the level of noise when compared to the current conditions of cars traveling in rural areas up to 65 dBA at a distance of 100 feet from the source. Therefore it is expected that activities of noise-sensitive wildlife would be impacted by noise levels up to 400 feet temporarily during construction and up to 150 feet during regular operation for all Freeway/Expressway (Freeway/Tollway) only alternatives.

4.9.3. Vibration

Similar to noise, it is expected that trains traveling on the HSR would generate vibrations as it passed along the rail. It is reasonable to expect that the vibrations would be detected by wildlife within the immediate vicinity, but it is difficult to quantify the level at which each individual animal would detect the vibrations and even more difficult to predict individual reactions. It is possible, and even expected at times, for wildlife that are attempting to cross the route at crossing points (culverts) would be stressed and not cross. Some individuals could attempt to cross again at a later time and some may never attempt again. However, the source of stressor (passing train) would occur for relatively short periods. Based on the anticipated daily train trips, it is expected that few individuals would be affected by the vibrations. Those that are affected would have periods without such stressor, providing opportunities to cross. Because of the relatively few anticipated daily train trips, momentary nature of the source of stressor, and opportunities without the source of the stressor, it is expected that impacts to wildlife activities caused by HSR vibrations would be less than substantial.

Larger vehicles such as semi-trucks traveling along the Freeway/Expressway (Freeway/Tollway) would also generate vibrations. These vibrations would be much less when compared to HSR trains due to the smaller mass of the vehicle and slower speed. As such, vibrations would attenuate over a short distance and are not expected to affect wildlife within the crossings or beyond the immediate road shoulder. Therefore, impacts to wildlife due to the use of any of the Freeway/Expressway (Freeway/Tollway) alternatives, variations or options would be considered less than substantial.

Vibrations would be generated by construction equipment during the construction phase of the project. Certain heavy equipment is known to cause vibrations when operating such as pile drivers, dozers, and large excavators. It is assumed that this equipment would have a need to operate within all areas of the disturbance envelope, including the margins of the project nearest the adjacent open space and

natural washes. It is the operation of heavy equipment in these areas that have the potential to substantially affect the movement of wildlife species. With the implementation of the below proposed mitigation measure, it is expected that impacts to nocturnal wildlife activities caused by construction equipment vibrations would be minimized to a point that is less than substantial. Diurnal wildlife activities would be temporarily impacted and wildlife from immediately surrounding construction areas would be temporarily displaced. Because it would be temporary and because construction would occur along the route in phases, impacts to diurnal wildlife activities is expected to be less than substantial.

Mitigation measures[BF17]:

1. Limit operation of vibration causing equipment such as pile drivers, dozers, large excavators to daylight hours when working in areas adjacent to open space.

2. Biological monitor shall be present to observe activities of wildlife during construction adjacent to open spaces. If activities are noted to affect wildlife, biological monitor shall stop construction activities as necessary.

4.9.4. Non-native Plants

Areas within the project development envelope consist of native and non-native plants. Although non-native plants already occur within the project footprint and within the vicinity, it can be reasonably concluded that creation of a larger roadway could exacerbate this condition.

4.9.5. Vehicle/Wildlife Collision Kills

Vehicle/wildlife collisions are known to occur on all types of roads where wildlife exist. Roads within the Mojave Desert are no different. Because roads already occur within the development envelope the question becomes, “How will vehicle/wildlife collisions change with the implementation of the proposed project?”

Various types of dirt, gravel and paved roads exist throughout the development envelope of the proposed project. With the exception of the areas where the new proposed Freeway/Expressway (Freeway/Tollway) intersect with the existing SR-14, SR-395, Interstate 15 and SR-18, no roads currently have the traffic volume that are expected to occur on the proposed Freeway/Expressway (Freeway/Tollway).

Road-strike data was collected in various areas of the project site during the wildlife crossing study. From this data we learned that wildlife was taken as a result of vehicle strikes. Because few animals were noted a statistical analysis could not be conducted to determine amount of collisions one could expect under the existing

conditions of the proposed project site. When attempting to understand the difference between existing conditions when compared to post-implementation of the proposed project we must assume relatively few strikes occur under current conditions. Because of the speed limits expected on the proposed Freeway/Expressway (Freeway/Tollway), and considering the expected volume of traffic within a rural area, it is expected that there would be a relatively high vehicle/wildlife collision rate. Therefore, there is potential for a substantial increase in vehicle/wildlife collisions to occur with the implementation of any of the proposed build alternatives. It appears there is no appreciable difference among any of the build alternatives, variations, or options. As such, the below mitigation measures are proposed. With the implementation of the proposed measures, it is expected that the increase in vehicle/wildlife collisions would be reduced to a level less than substantial.

1. Install fencing along the route that prevent wildlife from crossing in areas other than intended wildlife crossing locations. Fencing shall be installed to channel wildlife to the intended crossing locations.

2. Fencing shall be maintained throughout the existence of the Freeway/Expressway (Freeway/Tollway).

Any vehicle/wildlife strikes resulting from operation of the HSR would be an increase from the existing conditions since such a rail does not currently exist. However, with the implementation of measure 1 above, and because the rail line is located within the median of the Freeway/Expressway (Freeway/Tollway) for much of the route, few if any additional strikes resulting from the HSR are expected. Therefore, the alternative including HSR and all of the related variations and options would not substantially increase the number of vehicle/wildlife collisions.

4.9.6. Growth Inducement

It is reasonable to assume that the construction of a new highway a rural area such as many areas of the proposed project site will provide opportunities for development that would not otherwise exist. The construction of the Freeway/Expressway (Freeway/Tollway) would provide a faster travel time to/from the vicinity of the project site providing for development. It is challenging to predict the amount of development, or growth, of areas surrounding the project site and therefore difficult to quantify the impacts to the natural resources. It should be assumed that any growth that converts natural habitat to a developed condition would negatively impact biological resources. The level of impact would be dependent on the specifics of the individual project and would only be understood after the evaluation of those

individual projects. Analysis of known approved projects to biological resources is discussed in the Cumulative Impacts section.

4.9.7. Shading Effects

No shadowing effects (indirect impact), from bridge and abutment structures, to riparian vegetation is anticipated. A literature search was conducted on the effects of shading to riparian vegetation. Research indicates the amount of shading from structures is determined by orientation of the structure, type of structure, structure supports (i.e. bridge piers), height above water, length, and width. The literature search also revealed that very little studies have been conducted on this topic and most research focused on marine coastal ecosystems. One related study conducted by North Carolina State University (Broome, et. al., 2005) and funded by North Carolina Department of Transportation determined bridge height and width affected bio resources beneath the structure when the height/width ratio was less than 0.68-0.70. In other words, if a 35-foot wide bridge structure was located at or higher than 50-52 feet, no impacts to bio mass and vegetation would occur. However, if the structure is located less than 50 feet above the water, negative impacts from shading to vegetation and bio-mass would be expected and the lower this structure is to the water the greater the effect.

The bridge structure proposed for the crossing of the Mojave River is three individual structures, one for each direction of travel for the highway, east and west, and one for the high speed rail, with space between each structure. The width of each structure for highway travel is 56 feet and the width for the HSR is 49 feet, with at least 33 feet between each structure allowing for light between. As such, each structure acts as a separate structure for the purpose of ratio calculations. At a minimum height above the water at 80 feet, and as much as 135 feet, the ratio for each highway structure is 1.4 (80/56) and a ratio of 1.6 (80/49) for the HSR structure, far greater than the threshold of 0.7. Therefore, no indirect impacts to vegetation within the Mojave River due to shading are expected with the implementation of the proposed project.

Due to limited studies of research applicable to this project, Caltrans biologist Jeff Johnson conducted a qualitative survey of vegetation under and adjacent to existing bridges over the Mojave River, upstream and downstream of the project site. Bridges include the National Trails Highway, the BNSF Railroad (bridges both east and west of I-15), and the I-15 Bridge. In addition, one structure over the American River in Fresno was also investigated. Although these bridges are not at the same height, built using the same construction technique, or have the same orientation of the Preferred Alternative bridge, they do have riparian vegetation growing under the

structure and directly adjacent to the bridges, despite some shading. Please see photographs in Appendix M.

It should also be noted that during U.S. Fish and Wildlife review of impacts to Designated Critical Habitat within the Mojave River, it was determined that no indirect impacts to this resource would occur as a result of shading.

Chapter 5. Results: Permits and Technical Studies for Special Laws or Conditions

5.1. Federal Endangered Species Act Consultation Summary

The USFWS authorizes take of listed species and the destruction of critical habitat through Section 7(a)(2) of the FESA (16 USC 1531-1544). The USFWS issued a Biological Opinion (April 2016) for southwestern willow flycatcher, southwestern willow flycatcher critical habitat, and least Bell's vireo based on Variation E Main *Freewat/Expressway and Freeway/Tollway Alternatives with HSR Feeder Service*. The determination is that the project is not likely to adversely affect these species or the southerwestern willow flycatcher critical habitat. The USFWS has also issued a Biological Opinion (April 2016) for desert tortoise based on Variation E Main *Freewat/Expressway and Freeway/Tollway Alternatives with HSR Feeder Service*. The determination is that the project may affect, but is not liekley to adversely affect this specie. The project is not likely to adversely affect these biological reosurces because of low quality existing habitat within the BSA, project design, and the avoidance and minimization measures listed in Section 4.4. The formal consultation on the desert tortoise also concluded that the proposed project is not likely to jeopardize the continued existence of these species

5.2. Federal Fisheries and Essential Fish Habitat Consultation Summary

There are no federal fisheries issues associated with this project, and therefore, no effect on any federally listed fish species.

5.3. California Endangered Species Act Consultation Summary

The proposed project may have adverse effects to the State-listed as threatened desert tortoise and Mohave ground squirrel, and the State listed as endangered least Bell's vireo and southwestern willow flycatcher. CDFW authorizes take of endangered, threatened, or candidate species through the provisions of Section 2081 and 2080.1 of the FGC. Consultation with CDFW is ongoing because the proposed project may have adverse effects to eight species with those designations. A Consistency Determination under Section 2080.1 of the FGC for desert tortoise,

southwestern willow flycatcher, and least Bell's vireo, and western yellow-billed cuckoo, which are listed threatened or endangered under both the FESA and CESA would be required prior to project construction for any project-related effects to these species. An incidental take permit from CDFW under Section 2081 of the FGC for Swainson's hawk, golden eagle, Mohave ground squirrel, and Townsend's big-eared bat would be required prior to project construction for any project-related effects to these species.

On October 19, 2010, Caltrans (Paul Caron and Jeff Johnson) met with CDFW (Jamie Jackson, Eric Weiss, and Scot Harris) to present the project alignment and discuss survey needs. Caltrans and CDFW also met in June 2011 and February 2012 to discuss changes to the alignment and potential impacts to special-status species. In March 2013, Caltrans personnel (Paul Caron and Jeff Johnson) met with CDFW (Jamie Jackson) and USFWS (Ray Bransfield) in the USFWS Ventura Office to specifically discuss survey needs, impact analysis, and potential mitigation measures for the desert tortoise and southwestern willow flycatcher. An additional meeting occurred with CDFW (Becky Jones) in April 2013 to further discuss desert tortoise survey needs, impact analysis, design criteria, and mitigation measures. Numerous telephone conversations occurred between Caltrans (Jeff Johnson) and CDFW (Jamie Jackson) between 2011 and 2013 to discuss project alignment shifts and survey results and to request input on culvert design with regard to wildlife crossing.

5.4. Wetlands and Other Waters Coordination Summary

Preliminary findings and conclusions regarding the locations and extent of waters subject to the jurisdiction of the USACE, CDFW and SWRCB are discussed in several jurisdictional delineation reports that accommodate design changes and main alignment variations. This information was further analyzed by Caltrans biologists and is presented, but should not be considered final until concurrence is obtained by USACE, CDFW, and the SWRCB. Methods, results and impacts of the jurisdictional delineation are provided in Sections 2.2.8 and 3.1.3.2 and 4.1.4 of this report and in the jurisdictional delineation reports (Appendix I).

The project has two alternatives that avoid adverse impacts to federal wetlands. Specifically, the Freeway/Expressway (Freeway/Tollway) Alternative – Main Alignment and the Freeway/Expressway (Freeway/Tollway) with HSR Feeder Service – Main Alignment are the wetlands only practicable alternatives.

Per Executive Order 11990 for the Protection of Wetlands, the Freeway/Expressway (Freeway/Tollway) Alternative and Freeway/Expressway (Freeway/Tollway) with HSR Feeder Service – Variation E Alternative was identified as the most

environmentally damaging to federal wetlands and has been eliminated as a viable alternative.

5.4.1. USACE Jurisdiction

With the implementation of avoidance and minimization measures, incorporation of design modifications requested during public comments, and several options that were eliminated, permanent impacts to no more than 7.26 acres of waters of the U.S. and temporary impacts to no more than 20.11 acres of waters of the U.S. are anticipated within the proposed Freeway/Expressway (Freeway/Tollway) Alternative along the longest/widest variations.

With the implementation of avoidance and minimization measures, incorporation of design modifications requested during public comments, and several options that were eliminated, permanent impacts to no more than 4.84 acres of waters of the U.S. and temporary impacts to no more than 15.19 acres of waters of the U.S. are anticipated within the Freeway/Expressway (Freeway/Tollway) with HSR Feeder Service (Preferred Alternative).

These acreage conclusions represent a calculated estimation of the jurisdictional areas within the project impact area and are subject to modification following the USACE verification process.

The project is coordinating with USACE to obtain formal determinations on the regulatory status of the drainage features within the BSA. The formal determinations have been processed using two established methods: Preliminary Jurisdictional Determination (PJD) and Approved Jurisdictional Determination (AJD).

PJDs are non-binding, advisory in nature and consist of written indications that there may be waters of the United States, including wetlands, on a parcel or indications of the approximate location(s) of WUS or wetlands on a parcel." (See 33 C.F.R. 331.2.) The project has elected to use a PJD to voluntarily waive or set aside questions regarding CWA/RHA jurisdiction over the majority of the features identified in the BSA. This is in part in an effort to move ahead expeditiously to obtain a USACE permit authorization. Compensatory mitigation requirements and other resource protection measures that the project commits to will be decided on the basis of the PJD and will treat all waters and wetlands that would be affected in any way by the permitted activity on the site as if they are jurisdictional WUS.

The AJDs that have been filed for the project, once approved, will be an USACE determination that jurisdictional “waters of the United States,” or “navigable waters of the United States,” or both, are either present or absent at a particular location. Under this process the USACE will provide (subject to defined limitations) an AJD to

Caltrans for each feature that the project has specifically identified as non-jurisdictional to the USACE and requested a formal determination be made. Once finalized the AJD will constitute the USACE official, written representation that the jurisdictional delineation findings are correct and the AJD can be relied upon for five years. Formal determinations under the AJD process were requested for features that were examined or discussed during a project-specific site visit and meeting on February 4, 2016. During that meeting a few features from the jurisdiction delineation report were examined by Corps personnel and determined to be erosional features that did not fall under their jurisdiction. Additional features, such as Little Rock Creek were discussed in the context of the project and a formal determination has also been requested for that feature.

5.4.2. CDFW Jurisdiction

With the implementation of avoidance and minimization measures, incorporation of design modifications requested during public comments, and several options that were eliminated, permanent impacts to no more than 39.79 acres of CDFW jurisdictional features and temporary impacts to no more than 50.60 acres of CDFW jurisdictional features are anticipated within the proposed Freeway/Expressway (Freeway/Tollway) Alternative along the longest/widest variations.

With the implementation of avoidance and minimization measures, incorporation of design modifications requested during public comments, and several options that were eliminated, permanent impacts to no more than 41.47 acres of CDFW jurisdictional features and temporary impacts to no more than 46.12 acres of CDFW jurisdictional features are anticipated within the Freeway/ Expressway (Freeway/Tollway) with HSR Feeder Service (Preferred Alternative).

Rail Option 1C and Rail Option 7C have the least impacts to CDFW jurisdictional features compared to Rail Option 1A, Option 1B, Option 7A, and Option 7B of the Freeway/Expressway (Freeway/Tollway) with HSR Feeder Service.

Coordination with CDFW will be required to confirm jurisdictional features and obtain a 1602 Streambed Alteration Agreement.

5.4.3. SWRCB Jurisdiction

Within the project footprint for all of the alternatives, variations, and options, impacts to features regulated by RWQCB include USACE jurisdictional features under CWA Section 401 and isolated features in closed watershed areas that are subject to regulation under the Porter-Cologne Water Quality Control Act. RWQCB jurisdictional features are referred to collectively as “waters of the State”. The Mojave River, Fremont Wash, Turner Wash, Ossum Wash, Bell Mountain Wash, and

contributing unnamed washes in Mojave River Watershed are considered waters of the State as are named washes and contributing un-maned tributaries in the Antelope-Fremont Valleys Watershed that drain to Rosamond Dry Lake, Buckhorn Dry Lake, and Rogers Dry Lake on Edwards Air Force Base such as Mescal Creek, Big Rock Wash, and Little Rock Wash.

With the implementation of avoidance and minimization measures, incorporation of design modifications requested during public comments, and several options that were eliminated, permanent impacts to no more than 27.61 acres of RWQCB waters of the State and temporary impacts to no more than 45.96 acres of waters of the State are anticipated within the proposed Freeway/ Expressway and Freeway/Tollway alternatives along the longest/widest variations.

With the implementation of avoidance and minimization measures, incorporation of design modifications requested during public comments, and several options that were eliminated, permanent impacts to no more than 19.52 acres of waters of the State and temporary impacts to no more than 46.75 acres of waters of the State are anticipated within the Freeway/Expressway (Freeway/Tollway) with HSR Feeder Service (Preferred Alternative).

Rail Option 1C and Rail Option 7A have the least impacts to RWQCB jurisdictional features compared to Rail Option 1A, Option 1B, Option 7B, and Option 7C of the Freeway/Expressway (Freeway/Tollway) with HSR Feeder Service.

Coordination with the RWQCB will be required to confirm waters of the State and obtain Section 401 Water Quality Certification.

5.5. Invasive Species

In February 1999, Executive Order 13112 was signed, requiring Federal agencies to work on preventing and controlling the introduction and spread of invasive species. Highway corridors provide opportunities for the movement of invasive species through the landscape. Invasive species can move on vehicles and in the loads they carry. Invasive plants can be moved from site to site during spraying and mowing operations. Weed seed can be inadvertently introduced into the corridor on equipment during construction and through the use of mulch, imported soil or gravel, and sod. Some invasive plant species might be deliberately planted in erosion control, landscape, or wildflower projects. Highway rights-of-way provide ample opportunity for weeds in adjacent land to spread along corridors that, on a national scale, span millions of miles of highway.

Twelve exotic plants occurring on the California Exotic Plant Council's (Cal-IPC) Invasive Plant Inventory were identified in the BSA and throughout the project limits. Each plant in the inventory is given an overall rating of high, moderate, or limited. Plants with a rating of high have severe ecological impacts. Plants with a rating of moderate have a substantial and apparent, but not severe, ecological impact. Plants with a limited rating are invasive but their ecological impacts are minor on a statewide level. The invasive species identified in the BSA with a high rating include: giant reed (*Arundo donax*), Sahara mustard (*Brassica tornefortii*), red brome (*Bromus madritensis ssp. rubens.*), cheatgrass (*Bromus tectorum*) and Mediterranean tamarisk (*Tamarix ramosissima*). Moderate rated invasive species include: ripgut brome (*Bromus diandrus*), shortpod mustard (*Hirschfeldia incana*), Bermuda grass (*Cynodon dactylon*), foxtail barley (*Hordeum murium*). Limited rated invasive species include: redstem stork's bill (*Erodium cicutarium*), Russian thistle (*Salsola tragus*), and common Mediterranean grass (*Schismus barbatus*).

The project has the potential to spread invasive species to adjacent native habitats in the BSA by the entering and exiting of construction equipment contaminated by invasive species, the inclusion of invasive species in seed mixtures and mulch, and by the improper removal and disposal of invasive species so that seed is spread along the highway.

In compliance with EO 13112, a weed abatement program will be developed to minimize the importation of nonnative plant material during and after construction. Eradication strategies would be employed should an invasion occur. At a minimum, this program will include the following measures:

BIN-1: Inspect and clean construction equipment at the beginning and end of each day and prior to transporting equipment from one project location to another during construction. Remove as much plant material (roots, stems, leaves, seeds) from equipment and machinery as possible.

BIN-2: During construction, minimize soil and vegetation disturbance to the greatest extent feasible.

BIN-3: Ensure that all active portions of the construction site are watered a minimum of twice daily, or in compliance with any current or future drought policy outlining watering policies. This can be modified more often when needed due to dry or windy conditions. This measure is meant to prevent erosion due to wind and to minimize seed dispersal during construction.

BIN-4: Ensure that all material stockpiled is sufficiently stabilized (e.g., apply soil cement or equivalent) to prevent erosion due to wind to minimize non-

native plant growth during construction; different specifications will apply to topsoil storage.

BIN-5: During construction, obtain soil/gravel/rock from weed-free sources.

BIN-6: Use only certified weed-free straw, mulch, and/or fiber rolls for erosion control.

BIN-7: Following construction, revegetate affected areas adjacent to native vegetation with plant species that are native to the vicinity and that have been approved by the District Biologist.

BIN-8: Avoid the use of species listed by Cal-IPC's California Invasive Plant Inventory Database for revegetation of disturbed areas following construction.

BIN-9: Following construction, monitor erosion control measures and revegetation sites for two to three years in order to detect and control the introduction/establishment of non-native invasive species.

BIN-10: Outline eradication procedures to be employed (e.g., manual, mechanical, chemical) should a non-native invasive plant infestation occur. The use of herbicides will be prohibited within and adjacent to native vegetation, except as specifically authorized and monitored by the District Biologist and Restoration Ecologist.

5.6. Other

5.6.1. Migratory Bird Treaty Act and Fish and Game Code § 3503, 3503.5, 3513, 3700- 3705 and § 3800

The project has the potential to impact breeding/nesting birds protected by MBTA. The removal and/or trimming of trees and vegetation as a result of project activities may impact nesting birds within the project impact areas. At a minimum, this program will include the following measures:

- The removal and/or disturbance of trees or suitable roosting shrubbery would be minimized to the greatest extent possible.
- Wherever possible, vegetation would be trimmed and/or removed outside of core nesting period (February 15-September 1).
- Should bridges be widened/constructed during nesting season, a qualified biologist would be required to inspect the bridge for breeding/nesting birds.
- If avoidance of these activities during this period is not possible, preconstruction surveys by a qualified biologist would be conducted to identify any existing nests

or breeding birds within the area scheduled for construction. The survey should be completed no more than 48 hours prior to the start of project activities. Additional surveys would be conducted if more than 72 hours pass between preconstruction nesting bird surveys and the start of construction.

- If breeding/nesting birds are located within 150 ft of the limits of disturbance, a buffer shall be flagged around the nest and ESA signs posted. Any work within 150 ft of the flagged area would require a biologist to monitor the birds and ensure that the construction activities do not negatively impact the birds.
- If the biologist identifies signs of stress, the biologist will inform the Engineer that activities within the immediate area cannot resume until the birds resume their normal behavior or until the nest has been determined to be no longer active.
- Should breeding/nesting of raptors be located within the area scheduled for construction, the buffer shall be extended to 500 ft as raptors are more sensitive to disturbance.

Chapter 6. References

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Appendix A Project Maps

Appendix B USFWS and CNDDB Species List

Appendix C Plant Community Mapping Reports

Appendix D Desert Tortoise Survey Results

Appendix E Mohave Ground Squirrel Survey Reports

Appendix F Burrowing Owl Habitat Assessments

Appendix G Least Bell's Vireo and Southwestern Willow Flycatcher Surveys

Appendix H Wildlife Corridor Evaluations

Appendix I Jurisdictional Delineation Reports

Appendix J Resumes

Appendix K Wildlife Compendium

Appendix L Consolidated Raptor Report

Appendix M Bridge Examples Photos Compendium

Appendix N Consolidated Bat Survey Report