

3.7 Biological and Aquatic Resources

This section of the Revised Draft Environmental Impact Report (EIR)/Supplemental Draft Environmental Impact Statement (EIS) provides updates addressing the recent candidate listing, by the California Fish and Game Commission of the Southern California/Central Coast evolutionarily significant unit (ESU) mountain lion (*Puma concolor*) as Threatened under the California Endangered Species Act (CESA) (California Fish and Game Commission 2020) and the recent decision by the U.S. Fish and Wildlife Service (USFWS) to list the monarch butterfly (*Danaus plexippus plexippus*) as a candidate species under the federal Endangered Species Act.

This document provides information on the biology and ecology of the mountain lion and the monarch butterfly, as well as data sources used to determine the extent of potential habitat within the resource study area (RSA) for these species. In addition to providing new information about mountain lion and monarch butterfly, the Authority has identified two new mitigation measures to address impacts to wildlife resulting from lighting during construction and during project operation.

All revisions made in response to the updated information are being made in this Revised Draft EIR/Supplemental Draft EIS. All other subsections and appendices to Section 3.7 and the technical reports supporting Section 3.7 of the Draft EIR/EIS were not revised.

3.7.4.4 Pre-Field Investigation and Consultation

Wildlife Movement Corridors

Three analyses were conducted for focal species that represent a range of wildlife species. Nine focal species were selected to model wildlife movement across the Bakersfield to Palmdale Project Section, including four listed species. The focal species included in the local permeability analysis are listed below:

- Mountain lion (*Puma concolor*) Southern California/Central Coast ESU (candidate for state listing as threatened, and protected by Cal. Fish and Game Code Section 4800-4810 as a specially protected mammal)
- Mule deer (*Odocoileus hemionus*)
- American badger (*Taxidea taxus*) (protected by California Code of Regulations Title 14, § 461, and Cal. Fish and Game Code Section 4000)
- San Joaquin kit fox (*Vulpes macrotis mutica*) (Federally Endangered/State Threatened)
- Desert kit fox (*Vulpes macrotis*) (Fully Protected Fur-Bearing Species)
- Desert tortoise (*Gopherus agassizii*) (Federally Threatened/State Endangered)
- Western gray squirrel (*Sciurus griseus*)
- Tipton kangaroo rat (*Dipodomys nitratoides nitratoides*) (Federally/State Endangered)
- Blunt-nosed leopard lizard (*Gambelia sila*) (Federally/State Endangered, State Fully Protected)

3.7.5 Affected Environment

3.7.5.5 Special-Status Wildlife Species

Based on the background review, 126 special-status wildlife species were initially evaluated for their potential to occur within the RSA. Because of changes in their listing status since publication of the Draft EIR/EIS on February 28, 2020, the mountain lion (*Puma concolor*) and the monarch butterfly (*Danaus plexippus plexippus*) have also been evaluated for their potential to occur within the RSA. Sixty-eight of the 128 wildlife species were ruled out due to lack of suitable habitat, conversion of natural areas by human development, extensive water diversions, and local or regional extirpations, or because the RSA lies outside of these species' known geographic range. Therefore, these species are not discussed further in this report.

The remaining 58 special-status wildlife species are evaluated further in the technical report, and 2 species (mountain lion and monarch butterfly) have been evaluated in this Revised Draft EIR/ Supplemental Draft EIS for their potential to occur in the RSA. This evaluation was informed by the results of the California Natural Diversity Database search for special-status wildlife species occurrences within the RSA.

Of the 60 wildlife species potentially occurring in the RSA, 22 are federally or state-listed species, candidate species, or fully protected species, and 38 are considered species of concern by state or federal agencies. Critical habitat for the California condor is in the Supplemental Habitat Study Area (i.e., within 10 miles of the project footprint). The critical habitat for the California condor slightly overlaps the Supplemental Habitat Study Area in the foothills south of Tehachapi.

Fifteen special-status wildlife species were observed or identified by diagnostic sign (e.g., tracks, scat, or burrow) in the RSA during the 2011 wildlife habitat assessment, 2012 desert tortoise surveys, 2015 and 2016 field studies, and/or 2016 raptor surveys. These species are listed below.

- Yellow-blotched salamander (*Ensatina eschscholzii croceator*)—State Species of Special Concern (SSC)
- Blainville's horned lizard (*Phrynosoma blainvillii*)—State SSC
- Silvery legless lizard (*Anniella pulchra*)—State SSC
- Northern harrier (*Circus cyaneus*)—State SSC
- Swainson's hawk—State Threatened, Bureau of Land Management (BLM) Sensitive
- Golden eagle—State Fully Protected, BLM Sensitive
- White-tailed kite (*Elanus leucurus*)—State Fully Protected, BLM Sensitive
- California condor (*Gymnogyps californianus*)—Federal/State Endangered, State Fully Protected
- Burrowing owl (*Athene cunicularia*)—State SSC, BLM Sensitive
- American peregrine falcon (*Falco peregrinus*)—State Fully Protected
- Loggerhead shrike (*Lanius ludovicianus*)—State SSC
- Yellow warbler (*Dendroica petechia sonora*)—State SSC
- Tricolored blackbird (*Agelaius tricolor*)—State Threatened, BLM Sensitive
- San Joaquin kit fox (*Vulpes macrotis mutica*)—Federally Endangered, State Threatened
- American badger—State SSC (protected by California Code of Regulations Title 14, § 461, and Cal. Fish and Game Code Section 4000)

The following 14 federal and/or state-listed wildlife species have the potential to occur within the RSA. Two species under review for federal listing, one State Endangered species, and two species under review for state listing have the potential to occur within the RSA but have not been observed:

- Crotch bumblebee (*Bombus crotchii*)—Candidate for state listing
- Mountain lion (*Puma concolor*) Southern California/Central Coast ESU—Candidate for state listing as Threatened
- Kern primrose sphinx moth (*Euproserpinus euterpe*)—State Endangered
- Monarch butterfly (*Danaus plexippus plexippus*)—Candidate for federal listing as Threatened
- Blunt-nosed leopard lizard—Federally/State Endangered, State Fully Protected
- Desert tortoise—Federally Threatened, State Endangered
- Tricolored blackbird— BLM Sensitive

- Greater sandhill crane (*Grus Canadensis tabida*)—State Threatened, State Fully Protected, BLM Sensitive
- Yellow-billed cuckoo (*Coccyzus americanus*)—Federally Threatened, State Endangered
- Southwestern willow flycatcher (*Empidonax traillii extimus*)—Federally/State Endangered
- California condor (*Gymnogyps californianus*)—Federally/State Endangered, State Fully Protected
- Least Bell's vireo (*Vireo bellii pusillus*)—Federally/State Endangered
- Tipton kangaroo rat—Federally/State Endangered
- San Joaquin kit fox—Federally Endangered, State Threatened

Other Special-Status Mammal Species

The Tehachapi pocket mouse (*Perognathus alticolus inexpectatus*) and the Tulare grasshopper mouse (*Onychomys torridus tularensis*) are California SSC and are known to occur or have the potential to occur in the RSA, as well as the State Fully Protected ringtail (*Bassariscus astutus*). Additionally, the mountain lion (*Puma concolor*) is protected by California Fish and Game Code Section 4800-4810 as a specially protected mammal with a species range that spans the Tehachapi Mountain corridor. The Southern California/Central Coast ESU mountain lion population, which is a candidate for state listing as threatened, extends to State Route (SR) 58 as the northernmost limit of the ESU through the RSA.

3.7.5.9 Habitats of Concern

Habitats of concern consist of special-status plant communities, aquatic resources, essential fish habitat, critical habitat, protected trees, and wildlife movement corridors as described previously in Section 3.7.1.1, Key Definitions. Habitats of concern include essential fish habitat, critical habitat, and wildlife movement corridors.

Wildlife Movement Corridors

Areas where wildlife movement opportunities have been identified include the Central Valley, the Tehachapi Mountains and foothills, and the Mojave Desert.

Survey results from the three geographic regions show that there is currently a relatively high level of habitat connectivity between the suburban edges of Bakersfield and the desert area west of Rosamond where the Tehachapi Mountain foothills link the Sierra Nevada and the San Gabriel Mountains. Additionally, the mountain lion (*Puma concolor*) Southern California/Central Coast ESU population, a candidate for state listing as threatened, extends north to SR 58 and has been known to use the core and patch habitat within the Tehachapi Mountains. Further south, lower levels of habitat connectivity occur between the community of Rosamond and the Cities of Lancaster and Palmdale. Maintaining and/or improving habitat connectivity is important because species also use and migrate through these areas. Therefore, wildlife crossings are being incorporated into the project design.

3.7.6 Environmental Consequences

3.7.6.4 Construction Impacts—Biological Resource Impacts Common to All Bakersfield to Palmdale Project Section Build Alternatives

Impact BIO#2: Construction Impacts on Special-Status Wildlife Species

Construction of the project may result in direct and indirect impacts on special-status wildlife species and their habitat. Potential impacts on special-status wildlife species were determined using a habitat suitability approach. Table 3.7-6 provides a comparison of estimated potential impacts on suitable habitat for special-status wildlife species within the RSA. Additionally, Table 3.7-7 displays the results of the habitat species modeling utilized to address potential impacts on federally and state-listed species. This includes the areas within the CCNM Design Option and the Refined CCNM Design Option.

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Table 3.7-6 Comparison of Estimated Potential Effects on Suitable Habitat for Special-Status Wildlife Species within the Resource Study Area

Special-Status Wildlife Species	Alternative 1		Alternative 2		Alternative 3		Alternative 5		CCNM Design Option		Refined CCNM Design Option	
	Permanent (acres)	Temporary (acres)	Permanent (acres)	Temporary (acres)	Permanent (acres)	Temporary (acres)	Permanent (acres)	Temporary (acres)	Permanent (acres)	Temporary (acres)	Permanent (acres)	Temporary (acres)
American badger (<i>Taxidea taxus</i>)	2616.0	687.3	2562.1	696.7	2600.8	673.7	2587.7	696.8	-14.0	20.9	789.0	-67.6
Bendire's thrasher (<i>Toxostoma bendirei</i>)	299.3	25.6	299.3	25.6	268.0	15.8	300.2	28.2	No Change	No Change	No Change	No Change
Blainville's horned lizard (<i>Phrynosoma blainvilli</i>)	3877.4	1393.5	3821.0	1384.1	3891.5	1369.1	3877.4	1393.5	-11.6	15.2	783.0	-81.2
California legless lizard (<i>Anniella pulchra pulchra</i>)	911.1	290.5	916.2	290.5	910.4	283.3	911.1	290.5	-13.9	13.9	552.3	-47.5
Crotch bumblebee (<i>Bombus crotchii</i>)	5279.9	1309.5	5226.1	1319.0	5323.2	1280.8	5228.8	1327.2	-9.0	15.1	801.3	-80.5
Grasshopper sparrow (<i>Ammodramus savannarum</i>)	708.9	223.4	650.0	232.8	708.9	223.4	708.9	223.4	No Change	No Change	219.4	-15.4
Le Conte's thrasher (<i>Toxostoma lecontei</i>)	249.0	10.3	249.0	10.3	249.0	10.3	249.9	12.9	No Change	No Change	No Change	No Change
Loggerhead shrike (<i>Lanius ludovicianus</i>)	3094.0	1063.0	3089.7	1047.1	3077.6	1048.7	3064.9	1072.5	-14.0	20.9	789.2	-67.3
Long-eared owl (<i>Asio otus</i>)	691.8	233.9	691.8	233.9	721.5	236.4	691.8	233.9	-13.9	13.9	296.3	-39.9
Mountain plover (<i>Charadrius montanus</i>)	334.5	48.1	334.5	48.1	333.5	48.8	305.3	55.0	No Change	No Change	No Change	No Change
Northern harrier (<i>Circus cyaneus</i>)	1471.4	390.8	1412.4	400.2	1457.2	385.1	1442.1	397.7	-0.1	7.0	235.2	-19.3
Oregon vesper sparrow (<i>Pooecetes gramineus affinis</i>)	1160.7	445.8	1156.4	429.8	1160.7	445.8	1160.7	445.8	No Change	No Change	219.4	-15.4
Pallid bat (<i>Antrozous pallidus</i>)	5542.6	1424.4	5532.5	1405.8	5585.1	1396.5	5488.3	1442.4	-9.0	15.1	801.1	-79.6
Purple martin (<i>Progne subis</i>)	751.7	245.4	751.7	245.4	781.4	247.9	751.7	245.4	-13.9	13.9	552.8	-48.9
Redhead (<i>Aythya americana</i>)	5.0	0.2	5.0	0.2	5.0	0.2	2.7	0.5	No Change	No Change	No Change	No Change
San Joaquin whipsnake (<i>Masticophis flagellum ruddocki</i>)	733.5	228.8	679.6	238.3	733.5	228.8	733.5	228.8	No Change	No Change	219.4	-15.4
Short-eared owl (<i>Asio flammeus</i>)	1952.3	765.5	1940.9	749.3	1936.6	758.3	1920.7	772.7	-0.1	7.0	235.2	-19.3
Spotted bat (<i>Euderma maculatum</i>)	4452.9	1055.3	4452.9	1055.3	4495.4	1027.5	4398.6	1073.3	-9.0	15.1	325.0	-55.2
Tehachapi pocket mouse (<i>Perognathus alticolus inexpectatus</i>)	394.4	51.8	399.5	51.8	363.7	41.4	395.3	54.4	No Change	No Change	0.6	0.1
Townsend's big-eared bat (<i>Corynorhinus townsendii</i>)	766.5	249.0	766.5	249.0	796.4	252.2	765.7	249.0	-13.9	13.9	551.7	-48.1
Tricolored blackbird (<i>Agelaius tricolor</i>)	1713.6	658.2	1658.4	670.1	1697.8	651.1	1684.3	665.1	-0.1	7.0	233.4	-19.1
Tulare grasshopper mouse (<i>Onychomys torridus tularensis</i>)	2558.9	929.3	2508.8	941.2	2573.4	924.1	2529.6	936.3	-14.0	20.9	789.0	-68.0
Vermillion flycatcher (<i>Pyrocephalus rubinus</i>)	57.2	12.1	57.2	12.1	54.4	11.9	57.2	12.1	No Change	No Change	No Change	No Change
Western burrowing owl (<i>Athene cucularia</i>)	2108.0	710.2	2057.9	722.1	2061.6	692.7	2079.6	719.7	-0.1	7.0	235.9	-19.2
Western mastiff bat (<i>Eumops perotis californicus</i>)	7374.9	1892.0	7318.5	1882.6	7421.1	1863.8	7269.9	1915.0	-11.6	15.2	783.0	-81.2
Western pond turtle (<i>Actinemys marmorata</i>)	769.8	248.1	767.8	247.8	799.5	250.5	767.4	248.3	-13.9	13.9	552.8	-48.4
Western red bat (<i>Lasiurus blossevillii</i>)	2621.7	562.5	2620.5	541.1	2657.5	566.1	2567.9	567.8	-16.6	14.0	534.9	-49.3
Western snowy plover (<i>Charadrius alexandrinus nivosus</i>)	5.0	0.2	5.0	0.2	5.0	0.2	2.7	0.5	No Change	No Change	No Change	No Change
Yellow warbler (<i>Dendroica petechia brewsteri</i>)	706.2	237.6	706.2	237.6	736.2	240.9	706.2	237.6	-13.9	13.9	296.4	-39.1
Yellow-blotched salamander (<i>Ensatina eschscholtzii croceator</i>)	751.7	245.4	751.7	245.4	781.4	247.9	751.7	245.4	-13.9	13.9	552.8	-48.4
Yellow-breasted chat (<i>Icteria virens</i>)	15.9	4.4	15.9	4.4	16.2	5.2	15.9	4.4	0.0	0.0	-0.2	0.7
Yellow-headed blackbird (<i>Xanthocephalus xanthocephalus</i>)	0	0	0	0	0	0	0	0	No Change	No Change	No Change	No Change
Golden eagle (<i>Aquila chrysaetos</i>)	5,321.9	1,320.0	5,266.0	1,329.3	5,364.4	1,292.1	5,267.6	1,338.0	-9.0	15.1	794.0	-81.1

Source: California High-Speed Rail Authority, 2016
 Both CCNM Design Options data is applicable to all of the B-P Build Alternatives, and the values represent the increase/decrease as compared to the B-P Build Alternatives.
 B-P = Bakersfield to Palmdale Project Section
 CCNM = César E. Chávez National Monument

Table 3.7-7 Intersection of the Bakersfield to Palmdale Project Section Build Alternatives (Station to Station) and Modeled Federal and State Threatened/Endangered Species Habitat

Species	Category	Alternative 1		Alternative 2		Alternative 3		Alternative 5		CCNM Design Option		Refined CCNM Design Option	
		Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact
Bakersfield Cactus	Core Suitable Habitat	1,646.2	491.4	1,592.4	500.9	1,678.2	493.9	1,646.2	491.4	-12.3	10.2	701.4	-76.8
	Core Suitable Habitat—Intermediate Zone	694.4	162.8	694.4	162.8	673.2	156.8	683.3	165.8	No change	No change	No change	No change
	Potentially Suitable Habitat	75.1	18	75.1	18	75.1	18	75.1	18	-1.8	10.7	72.2	5.2
	Potentially Suitable Habitat—Intermediate Zone	108.8	18.3	108.8	18.3	108.8	18.3	90.7	22.2	No change	No change	No change	No change
	Bakersfield Cactus Total	2,524.5	690.5	2,470.7	700.0	2,535.3	687.0	2,495.3	697.4	-14	209	773.6	-71.6
Blunt-Nosed Leopard Lizard	Atypical Habitat	219.2	130.4	264.8	96.9	219.2	130.4	219.2	130.4	No change	No change	No change	No change
	Core Suitable Habitat	492	126.7	492	126.7	492	126.7	492	126.7	No change	No change	96.9	-2.0
	Potentially Suitable Habitat	282.4	106.2	246.2	110.5	282.4	106.2	282.4	106.2	-2.9	1.5	148.5	-22.1
	Blunt-Nosed Leopard Lizard Total	993.6	363.3	1003.0	334.1	993.6	363.3	993.6	363.3	-2.9	1.5	245.3	-24.1
California Condor	Historical Range	2248.4	795.4	2253.5	795.8	2219.3	788.5	2248.4	795.4	-9	15.1	801.1	-79.6
	California Condor Total	2248.4	795.4	2253.5	795.8	2219.3	788.5	2248.4	795.4	-9	15.1	801.1	-79.6
California Jewelflower	Core Suitable Habitat	744	214	684.3	222.6	744	214	744	214	-1.9	1.3	251.1	-16.0
	Potentially Suitable Habitat	55.9	19.5	56.6	20.4	55.9	19.5	55.9	19.5	-1	0	-3.1	-7.0
	California Jewelflower Total	799.9	233.5	740.9	243.0	799.9	233.5	799.9	233.5	-2.9	1.5	248.1	-22.9
California Red-Legged Frog	Breeding Season Aquatic Habitat	0	0	0	0	0	0	0	0	No change	No change	No change	No change
	Dispersal/Seasonal Movement Habitat	0	0	0	0	0	0	0	0	No change	No change	No change	No change
	Other Potential Movement Habitat	0	0	0	0	0	0	0	0	No change	No change	No change	No change
	Permeable Movement Area (Dev, Ag, Disturbed)	0	0	0	0	0	0	0	0	No change	No change	No change	No change
	Refugia/Foraging Habitat	0	0	0	0	0	0	0	0	No change	No change	No change	No change
	California Red-Legged Frog Total	0	0	0	0	0	0	0	0	No change	No change	No change	No change
Desert Tortoise	Low Value Suitable Habitat	1381.3	355.5	1381.3	355.5	1365.9	326.2	1348.6	365.5	No change	No change	No change	No change
	Moderately Value Suitable Habitat	842.7	228.1	842.7	228.1	879.8	228.2	842.7	228.1	No change	No change	No change	No change
	Potentially Suitable Habitat in Urban Setting	928.6	48.4	928.6	48.4	928.6	48.4	909.4	55.7	No change	No change	No change	No change
	Desert Tortoise Total	3,152.6	632.0	3,152.6	632.0	3,174.3	602.8	3,100.7	649.3	No change	No change	No change	No change
Kern Mallow	Core Suitable Habitat	632.8	183.8	573.2	192.3	632.8	183.8	632.8	183.8	No change	No change	No change	No change
	Potentially Suitable Habitat	46.2	10.6	46.9	11.4	46.2	10.6	46.2	10.6	No change	No change	No change	No change
	Kern Mallow Total	679.0	194.4	620.1	203.7	679.0	194.4	679.0	194.4	No change	No change	No change	No change
Kern Primrose Sphinx Moth	Potentially Suitable Habitat	794.6	206.9	766.4	213	795.8	206.5	794.6	206.9	No change	No change	126.5	-7.2
	Kern Primrose Sphinx Moth Total	794.6	206.9	766.4	213.0	795.8	206.5	794.6	206.9	No change	No change	126.5	-7.2
Least Bell's Vireo	Recolonization Breeding Habitat	13.4	4.1	13.4	4.2	13.8	4.2	13.4	4.1	No change	No change	3.8	1.1
	Least Bell's Vireo Total	13.4	4.1	13.4	4.2	13.8	4.2	13.4	4.1	No change	No change	3.8	1.1

Species	Category	Alternative 1		Alternative 2		Alternative 3		Alternative 5		CCNM Design Option		Refined CCNM Design Option	
		Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact
Mohave Ground Squirrel	High Value Suitable Habitat	362.5	87.8	362.5	87.8	362.5	87.8	345	88.4	No change	No change	No change	No change
	Low Value Suitable Habitat	1,006.1	290.8	1,006.1	290.8	1,002.5	272.2	1,003.3	290.4	No change	No change	No change	No change
	Moderately High Value Suitable Habitat	952.1	245	952.1	245	962.8	233.8	948.3	248.7	No change	No change	No change	No change
	Potentially Suitable Habitat in Urban Setting	1,017	53.7	1,017	53.7	1,017	53.7	989.2	67.1	No change	No change	No change	No change
	Mohave Ground Squirrel Total	3,337.7	677.3	3,337.7	677.3	3,344.8	647.5	3,285.8	694.6	No change	No change	No change	No change
Monarch Butterfly	Breeding and Foraging Habitat	7,375.1	1,892.0	7,318.7	1,882.7	7,421.2	1,863.8	7,270.1	1,915.0	-11.6	15.2	783.0	-81.2
	Monarch Butterfly Total	7,375.1	1,892.0	7,318.7	1,882.7	7,421.2	1,863.8	7,270.1	1,915.0	-11.6	15.2	783.0	-81.2
Mojave Tarplant	High Value Suitable Habitat	2.5	0.6	2.5	0.6	44.6	7.8	2.5	0.6	No change	No change	No change	No change
	Moderately High Value Suitable Habitat	325	79.4	325	79.4	374.7	74.6	325	79.4	No change	No change	66.4	-3.7
	Mojave Tarplant Total	327.5	80.0	327.5	80.0	419.3	82.4	327.5	80.0	No change	No change	66.4	-3.7
Mountain Lion	Core and Patch Habitat	33.4	12.6	33.4	12.6	33.4	12.6	33.4	12.6	No change	No change	No change	No change
	Other Potential Suitable Habitat	621.1	334.0	621.1	334.0	661.9	332.4	621.1	334.0	No change	No change	-4.0	-4.5
	Mountain Lion ESU Habitat Total	654.5	346.6	654.5	346.6	674.5	345.0	654.5	346.6	No change	No change	No change	No change
San Joaquin Adobe Sunburst	Core Suitable Habitat	41.6	16.7	38	16.4	41.6	16.7	41.6	16.7	-1.2	3.2	10.5	0.7
	Potentially Suitable Habitat	933.1	215.2	879.7	228.2	933.1	215.2	933.1	215.2	-0.6	3.6	550.7	-23.8
	San Joaquin Adobe Sunburst Total	974.7	231.9	917.7	244.6	974.7	231.9	974.7	231.9	-1.7	6.9	561.2	-23.0
San Joaquin Kit Fox	High Value Suitable Habitat	95.2	22.1	97.5	20.3	95.2	22.1	95.2	22.1	No change	No change	No change	No change
	Low Value Suitable Habitat	1,082.4	373.3	1,083.4	357.5	1,082.4	373.3	1,082.4	373.3	No change	No change	399.6	-21.0
	Moderate Value Suitable Habitat	79.9	22.9	82.3	23.6	79.9	22.9	79.9	22.9	No change	No change	80.0	-4.7
	Urban Suitable Habitat	422.9	180.9	360.3	188.4	422.9	180.9	422.9	180.9	No change	No change	No change	No change
	San Joaquin Kit Fox Total	1,680.4	599.2	1,623.5	589.8	1,680.4	599.2	1,680.4	599.2	No change	No change	479.6	-25.8
San Joaquin Woolly-Threads	Core Suitable Habitat	696.5	198.3	642.6	207.7	696.5	198.3	696.5	198.3	No change	No change	No change	No change
	Potentially Suitable Habitat	7.1	1.5	7.1	1.5	7.1	1.5	7.1	1.5	No change	No change	No change	No change
	San Joaquin Woolly-Threads Total	703.6	199.8	649.7	209.2	703.6	199.8	703.6	199.8	No change	No change	No change	No change
Striped Adobe Lily	Core Suitable Habitat	21.1	9.7	21.1	9.7	21.1	9.7	21.1	9.7	-1.7531	10.7488	11.8	0.6
	Potentially Suitable Habitat	1,792.9	528.3	1,734.0	537.7	1,825.0	530.4	1,792.9	528.3	-12.2856	10.1661	757.5	-72.2
	Striped Adobe Lily Total	1,814.0	538.0	1,755.1	547.4	1,846.1	540.1	1,814.0	538.0	-14.0	20.9	769.4	-71.6
Swainson's Hawk	Active Nesting Habitat	2.2	1.1	2.2	1.1	1.7	1.1	2.2	1.1	No change	No change	No change	No change
	Inactive Nesting Habitat	125.3	2.7	125.3	2.7	125.3	2.7	112.6	1.8	No change	No change	No change	No change
	Migratory Season Foraging Habitat	1,113.8	500.3	1,113.8	500.3	1,167.7	505.8	1,113.8	500.3	12.1	-3.6	219.5	-57.2
	Other Potential Breeding Season Foraging Habitat	129.8	82.4	109.9	92.2	103.8	78.6	129.8	82.4	No change	No change	49.9	6.2
	Potential Primary Foraging Habitat	212.3	10.2	212.3	10.2	212.3	10.2	197.1	15.1	No change	No change	No change	No change
	Potential Secondary Foraging Habitat	712.3	90.8	712.3	90.8	712.3	90.8	707.6	101.9	No change	No change	No change	No change
	Primary Active Foraging Habitat	657.9	160	657.9	160	709.6	157	657.9	160	No change	No change	9.6	No change
	Secondary Active Foraging Habitat	2,262.4	631.2	2,256.8	631.1	2,204.2	614.6	2,261.7	630.7	-27	20.5	507.2	-32.4
Swainson's Hawk Total	5,216.0	1,478.7	5,190.5	1,488.4	5,236.9	1,460.8	5,182.7	1,493.3	-14.9	16.9	786.3	-83.4	

Species	Category	Alternative 1		Alternative 2		Alternative 3		Alternative 5		CCNM Design Option		Refined CCNM Design Option	
		Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact	Permanent Impact	Temporary Impact
Tehachapi Slender Salamander	Core Occupied Habitat	39.3	5.7	39.3	5.7	39.3	5.7	39.3	5.7	No change	No change	9.1	2.5
	Potentially Suitable Habitat	65.1	21.6	65.1	21.6	75.4	23.5	65.1	21.6	4.4	3.7	72.9	5.5
	Tehachapi Slender Salamander Total	104.4	27.3	104.4	27.3	114.7	29.2	104.4	27.3	4.4	3.7	81.9	7.9
Tipton Kangaroo Rat	Other Potentially Suitable Habitat	675	194.8	615.4	203.4	675	194.8	675	194.8	No change	No change	249.9	-18.4
	Tipton Kangaroo Rat Total	675.0	194.8	615.4	203.4	675.0	194.8	675.0	194.8	No change	No change	249.9	-18.4
Tricolored Blackbird	Breeding Season Foraging—Agriculture	175.2	252.4	179	255	176.4	251.1	175.2	252.4	No change	No change	No change	No change
	Breeding Season Foraging—Natural	1158.2	304.9	1130.3	310.4	1137.7	297.2	1153	309	1.2	5.5	233.3	-12.4
	Non-Breeding Season Foraging—Agriculture	57.2	12.1	57.2	12.1	54.4	11.9	57.2	12.1	No change	No change	No change	No change
	Non-Breeding Season Foraging—Natural	46.1	12	46.1	12	45.9	12.4	46.1	12	No change	No change	No change	No change
	Occupied Colony Habitat	3	0.7	3	0.7	3	0.7	3	0.7	No change	No change	No change	No change
	Suitable Colony Habitat	4.2	0.9	4.1	0.8	3.8	1	4.2	0.9	No change	No change	No change	No change
	Tricolored Blackbird Total	1,443.9	583.0	1,419.7	591.0	1,421.2	574.3	1,438.7	587.1	1.2	5.5	233.3	-12.4
Western Yellow-Billed Cuckoo	Other Potentially Suitable Breeding Habitat	1.3	0.3	1.3	0.3	1.3	0.3	1.3	0.3	No change	No change	No change	No change
	Western Yellow-Billed Cuckoo Total	1.3	0.3	1.3	0.3	1.3	0.3	1.3	0.3	No change	No change	No change	No change
Willow Flycatcher	Moderate Potentially Suitable Habitat	0	0	0	0	0	0	0	0	No change	No change	No change	No change
	Potentially Suitable Habitat	23.3	5.3	23.3	5.4	22.5	6.2	22.5	5.3	No change	No change	3.8	1.1
	Willow Flycatcher Total	23.3	5.3	23.3	5.4	22.5	6.2	22.5	5.3	No change	No change	3.8	1.1

Source: California High-Speed Rail Authority, 2016

Both CCNM Design Options data is applicable to all of the B-P Build Alternatives, and the values represent the increase/decrease as compared to the B-P Build Alternatives.

B-P = Bakersfield to Palmdale Project Section

CCNM = César E. Chávez National Monument

ESU = evolutionarily significant unit

Temporary

Temporary construction impacts on special-status wildlife species may result from activities such as construction vehicle traffic; the temporary use of land for staging and access areas (although these areas would be sited within areas planned for permanent impacts to the maximum extent practicable); noise, light, and vibration from construction activities; temporary dewatering of surface waters during construction; and other construction-related activities that are temporary in nature.

Permanent

Permanent construction impacts include the permanent conversion of habitat to project infrastructure, which could result in the loss of individuals of special-status wildlife species and their habitats within the limits of disturbance.

Amphibians

Direct impacts on special-status amphibian species (Tehachapi slender salamander [*Batrachoseps stebbinsi*], foothill yellow-legged frog [*Rana boylei*], western spadefoot toad [*Spea hammondi*], and yellow-blotched salamander [*Ensatina eschscholzii croceator*]) could include mortality and injury of adults, eggs or egg masses, and larvae resulting from construction activities in suitable upland or aquatic habitat. Amphibians and their eggs or larvae could be disturbed, injured, or killed if any construction activity, such as temporary dewatering of surface waters to enable construction, occurs within wetlands, ponds, or streams. Mortality and injury or harassment may also occur if these species become trapped in open, excavated areas. Other direct impacts on habitat for these species could include destruction of refugia (e.g., burrows), temporary shifts in foraging patterns or territories, and increased predation as a result of increased noise and vibration, light, and ground disturbance. Direct impacts from construction activities could include displacement, mortality or injury, or harassment as a result of the destruction, temporary dewatering, degradation, fill, pollution, or permanent conversion of aquatic breeding or upland refugia habitat. Additionally, direct impacts may result from permanent changes in micro-/local hydrology.

Indirect impacts on aquatic habitat could occur as a result of changes in the retention/infiltration of runoff to aquatic habitat, or a disturbance of the underlying hardpan soils of these habitats. Indirect impacts on amphibians could occur from the construction of high-speed rail (HSR) components that alter the landscape and may include changes in water velocity and periods of inundation in nearby habitats. The fragmentation of the habitats and landscapes resulting from construction of the HSR project components (e.g., security fences, elevated structures, railbeds, and associated facilities) may interfere with the daily and seasonal movement and dispersal of the special-status amphibian species. Indirect impacts could also result from the introduction and colonization of nonnative plant species, which may reduce habitat quality.

Reptiles

Direct impacts on special-status reptiles (blunt-nosed leopard lizard [*Gambelia sila*] and desert tortoise [*Gopherus agassizii*]) could include mortality, injury, or harassment (in the case of the federally listed desert tortoise) of adults, eggs, or juveniles as a result of construction activities in suitable habitat. Construction may result in the destruction or degradation of habitat and the loss of nesting areas, burrows, or other refugia. In addition, ground disturbance, noise, and vibration associated with these activities could disrupt the activities of individuals and may impair normal life cycle behaviors. Mortality, injury, or harassment may also occur if these species become trapped in open, excavated areas. The Authority understands that the blunt-nosed leopard lizard is fully protected and the project would be designed to avoid take if potential direct impacts on this species are identified.

Indirect impacts on reptiles may include the inadvertent introduction of invasive (noxious) weeds (e.g., yellow star-thistle [*Centaurea solstitialis*]), which can reduce habitat suitability. The fragmentation of the habitats and landscapes resulting from construction of the HSR project components (e.g., security fences, elevated structures, railbeds, and associated facilities) may interfere with the daily and seasonal movement and dispersal of the special-status reptile species. Indirect impacts could also result from the introduction and colonization of nonnative plant species, which may reduce habitat quality. In addition, soil compaction and the placement of

fill in suitable habitat may indirectly affect special-status reptiles by prohibiting burrowing or by changing the frequency of vegetative cover.

Insects

Direct impacts on special-status insects (Crotch bumblebee [*Bombus crotchii*], monarch butterfly [*Danaus plexippus plexippus*], and Kern primrose sphinx moth [*Euproserpinus Euterpe*]) could include mortality or injury of adults, eggs, or juveniles as a result of construction activities in suitable habitat. Construction may also result in the destruction or degradation of habitat and the loss of hives. Mortality, injury, or harassment may also occur if these species become trapped in open, excavated areas.

Indirect impacts on special-status insects (Crotch bumblebee, monarch butterfly, and Kern primrose sphinx moth) fragmentation of habitats and landscapes resulting from construction of the HSR project components (e.g., security fences, elevated structures, and associated facilities) which may interfere with the daily and seasonal movement and dispersal of the special-status insect species. Indirect impacts could also result from the introduction and colonization of nonnative plant species, which may reduce habitat quality.

Birds (including Migratory Birds Protected by the California Fish and Game Code)

Construction activities may directly affect a number of special-status passerine birds, special-status wading birds, special-status raptors, shorebirds, duck species, and migratory birds (including bird species listed in Table 3.7-6 and Table 3.7-7) through the disturbance of potential habitat. Such disturbance includes noise and vibration associated with construction activities and equipment. Impacts may include the displacement, mortality, or injury of special-status bird species. If construction occurs during the breeding season (February 1–September 1), active nests could be disturbed, potentially causing the loss of eggs or developing young (i.e., nest abandonment during the incubation, nestling, or fledgling stages of these species). Direct impacts from construction activities could include displacement, mortality, injury, or harassment as a result of the destruction, degradation, fill, pollution, or permanent conversion of aquatic breeding or upland refugia habitat for water birds. Additionally, direct impacts may result from permanent changes in micro-/local hydrology, and construction generated disturbance such as noise and vibration associated with construction activities near nests could disrupt individuals and cause adults to abandon their eggs or recently hatched young if they perceive such disturbances as a threat.

Indirect impacts on birds as a result of temporary habitat conversion could include shifts in foraging patterns or territories, increased predation, and decreased reproductive success. The inadvertent introduction of invasive (noxious) weeds could reduce habitat suitability for these species.

Direct impacts from construction activities may include the removal, disturbance, or abandonment of potential nesting habitat for special-status passerine birds, special-status wading birds, special-status raptors, shorebirds, duck species, and migratory birds. Direct impacts could result from the fragmentation of the landscape, which may interfere with daily or seasonal movement, foraging, and dispersal of bird species.

Indirect impacts on birds may result from fragmentation of the landscape. This may result in shifts in foraging patterns or territories, or in decreased reproductive success and reduced population viability. Indirect impacts may include any additional habitat changes from the colonization and spread of nonnative plant species, which may further reduce adjacent habitat suitability.

Of particular concern would be bird species that have a regulatory status beyond the MBTA and California Fish and Game Code sections that apply to virtually all native species (e.g., threatened, endangered, and fully protected species). Among the latter are the California condor and golden eagle, which merit focused discussion because of particular nesting requirements and, in the case of the California condor, a propensity to investigate unusual activities within their territories.

Human presence associated with project construction activities may deter nesting by golden eagle at any of the 14 active nests that are currently known within 1 mile of the project alignment, and it is possible that 1 or 2 nest sites would be directly impacted. However, based on available

information (Bloom 2019; Braham et al. 2015; Poessel et al. 2016) it is difficult to estimate the effect in terms of the number of pairs as there are several factors to be considered with respect to golden eagle utilization of the project vicinity:

1. There are currently approximately 28 to 30 golden eagle territories within the raptor study area.
2. Golden eagle pairs are known to use multiple nest sites, such that the loss of a specific site may or may not affect the success of a territory.
3. There is a great deal of variation in the impacts of human presence on a particular nest site, depending on the specific spatial relationships relative to terrain and the nature of the activity.
4. Golden eagle territories are large, highly variable in size, and highly variable seasonally. For example, studies in the Mojave Desert and the Tehachapi Mountains (Braham and Poessler, respectively) have found average home range sizes on the order of 98 to 120 square miles, and minimum and maximum home ranges of 2 square miles and 1,370 square miles, respectively.

These factors provide context for considering the potential impacts of the project, which include the permanent loss of approximately 10 square miles of foraging habitat in a raptor study area that includes approximately 537 square miles of foraging habitat.

While there are currently no known California condor nests in the project vicinity, foraging occurs in the Tehachapi Mountains and foothills, and California condors are known to investigate areas of human activity and to be attracted to anthropogenic objects, including trash.

Mammals

Construction activities also have the potential to affect special-status mammals (Mohave ground squirrel [*Xerospermophilus mohavensis*], Tipton kangaroo rat [*Dipodomys nitratoides nitratoides*], Townsend's big-eared bat [*Corynorhinus townsendii*], San Joaquin kit fox [*Vulpes macrotis mutica*], ringtail [*Bassariscus astutus*], and mountain lion [*Puma concolor*]) directly and indirectly. This includes the Southern California/Central Coast ESU mountain lion population (south of SR 58), which is now a candidate for listing under CESA due to the continued fragmentation and loss of habitat. Direct impacts could include mortality and injury of mammal species from vehicle strikes in construction work areas or the incidental collapsing of occupied burrows/dens by construction equipment. Noise, dust, and increased vibration may also directly affect mammal species populations and habitat. Lighted construction areas could disorient species (e.g., bats) and disrupt nocturnal foraging activities of other mammal species. Ground disturbance could lead to the temporary loss of foraging and burrowing habitat. Direct impacts on mammals would be primarily related to habitat conversion. Burrowing, denning, and foraging habitat may be lost through ground disturbance and/or habitat degradation, temporary dewatering, or land conversion from natural and bare-earth habitats to developed, hardscaped land uses. In addition, increased noise levels and human presence may influence local shifts in populations, and noise and vibration associated with construction activities could disrupt individuals and may impair normal life cycle behaviors.

As part of the B-P Build Alternatives, BIO-IAMF#1 through BIO-IAMF#3, BIO-IAMF#5 through BIO-IAMF#12, and HYD-IAMF#1 and HYD-IAMF#2 would be incorporated to avoid and/or minimize impacts on biological and aquatic resources from project construction, as applicable and discussed in Section 3.7.4.2. The Authority would incorporate these IAMFs to reduce and minimize impacts by designating a project biologist and species-specific and general biological monitors during construction (BIO-IAMF#1). In addition, the Authority would develop and implement a BRMP to identify special-status species to be avoided during construction (BIO-IAMF#5). The BRMP would be a compilation of the biological resources avoidance and minimization measures applicable to the project section and other project environmental plans, such as the RPP and WCP. Requirements have also been incorporated that would require the Authority to delineate ESAs or environmentally restricted areas on final construction plans and in the field using measures such as flagging or fencing. Under all of the B-P Build Alternatives, the Authority would require construction crews to attend WEAP training and certify that they

understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3). This would avoid some (but not all) direct impacts on special-status wildlife species because it would establish that contractors must be aware of and avoid affecting special-status wildlife species occurrences during construction. Removal and disturbance of potential habitat in temporary impact areas and for the placement of permanent infrastructure from construction of the B-P Build Alternatives would directly affect special-status wildlife species as listed and discussed above. HYD-IAMF#1 and HYD-IAMF#2 would also be implemented. HYD-IAMF#1 addresses stormwater management and requires that a plan for management and treatment be prepared prior to construction. HYD-IAMF#2 requires preparation of a flood protection plan prior to construction.

Native Fauna

Direct and indirect impacts for other native fauna (e.g., insects, mollusks, crustaceans, amphibians, reptiles, birds, and mammals) are similar to those described above for special-status wildlife species.

As part of the B-P Build Alternatives, BIO-IAMF#1 through BIO-IAMF#3, BIO-IAMF#5 through BIO-IAMF#12, and HYD-IAMF#1 and HYD-IAMF#2 would be incorporated to avoid and/or minimize impacts on biological and aquatic resources from project construction, as applicable and discussed in Section 3.7.4.2. The Authority would incorporate these IAMFs to reduce and minimize impacts by designating a project biologist and species-specific and general biological monitors during construction (BIO-IAMF#1). In addition, the Authority would develop and implement a BRMP to identify special-status species to be avoided during construction (BIO-IAMF#5). The BRMP would be a compilation of the biological resources avoidance and minimization measures applicable to the project section and other project environmental plans, such as the RPP and WCP. Requirements have also been incorporated that would require the Authority to delineate ESAs or environmentally restricted areas on final construction plans and in the field using measures such as flagging or fencing. Under all of the B-P Build Alternatives, the Authority would require construction crews to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources (BIO-IAMF#3). This would avoid some (but not all) direct impacts on special-status wildlife species because it would establish that contractors must be aware of and avoid affecting special-status wildlife species occurrences during construction. Removal and disturbance of potential habitat in temporary impact areas and for the placement of permanent infrastructure from construction of the B-P Build Alternatives would directly affect special-status wildlife species as listed and discussed above. HYD-IAMF#1 and HYD-IAMF#2 would also be implemented. HYD-IAMF#1 addresses stormwater management and requires that a plan for management and treatment be prepared prior to construction. HYD-IAMF#2 requires preparation of a flood protection plan prior to construction.

CEQA Conclusion

The design characteristics of the B-P Build Alternatives include effective IAMFs to identify special-status wildlife species (including amphibians, reptiles, insects, birds, and mammals) habitat and delineate ESAs, or environmentally restricted areas, on final construction plans and in the field. These measures would reduce, but not avoid, impacts on special-status wildlife species and nesting and foraging habitat for special-status birds. Based on the CEQA thresholds identified in Section 3.7.4.7, the impact under CEQA to special-status wildlife species would be potentially significant under any of the B-P Build Alternatives. This determination is because of habitat removal, degradation, or modification resulting from ground disturbance during construction and potential wildlife disturbances/losses from construction activities, noise and vibration activities that could cause roost abandonment, and disruption of normal life cycle behaviors which would cause a substantial adverse effect on special-status wildlife species.

Therefore, effective mitigation measures have been identified in Section 3.7.7 to reduce impacts on special-status wildlife species to a less than significant level by avoidance, protection, or restoration methods. These measures include the following:

- **Amphibians, Reptiles, and Insects**
 - BIO-MM#7: Conduct Pre-Construction Surveys for Special-Status Reptile and Amphibian Species
 - BIO-MM#8: Implement Avoidance and Minimization Measures for Special-Status Reptile and Amphibian Species
 - BIO-MM#11: Conduct Surveys for Blunt-Nosed Leopard Lizard
 - BIO-MM#13: Implement Avoidance Measures for Blunt-Nosed Leopard Lizard
 - BIO-MM#36: Install Aprons or Barriers within Security Fencing
 - BIO-MM#50: Implement Measures to Minimize Impacts during Off-Site Habitat Restoration, or Enhancement, or Creation on Mitigation Sites
 - BIO-MM#55: Prepare and Implement a Weed Control Plan
 - BIO-MM#58: Establish Environmentally Sensitive Areas and Non-Disturbance Zones
 - BIO-MM#61: Establish and Implement a Compliance Reporting Program
 - BIO-MM#62: Prepare Plan for Dewatering and Water Diversions
 - BIO-MM#63: Work Stoppage
 - BIO-MM#75: Minimize Impacts on Kern Primrose Sphinx Moth Host Plants
 - BIO-MM#79: Mitigation for Desert Tortoise
 - BIO-MM#80: Conduct Surveys and Implement Avoidance Measures Crotch Bumble Bee
 - BIO-MM#82: Avoid Direct Impacts on Monarch Butterfly Host Plants
 - BIO-MM#86: Implement Lighting Minimization Measures During Construction
- **Birds (Including Migratory Birds Protected by California Fish and Game Code)**
 - BIO-MM#14: Conduct Pre-Construction Surveys and Delineate Active Nest Buffers Exclusion Areas for Breeding Birds
 - BIO-MM#15: Conduct Pre-Construction Surveys and Monitoring for Raptors
 - BIO-MM#16: Implement Avoidance Measures for California Condor
 - BIO-MM#17: Conduct Surveys for Swainson’s Hawk Nests and Implement Avoidance and Minimization Measures
 - BIO-MM#18: Implement Avoidance and Minimization Measures for Swainson’s Hawk Nests
 - BIO-MM#20: Conduct Protocol Surveys for Burrowing Owls
 - BIO-MM#21: Implement Avoidance and Minimization Measures for Burrowing Owl
 - BIO-MM#36: Install Aprons or Barriers within Security Fencing
 - BIO-MM#56: Conduct Monitoring of Construction Activities
 - BIO-MM#58: Establish Environmentally Sensitive Areas and Non-Disturbance Zones
 - BIO-MM#61: Establish and Implement a Compliance Reporting Program
 - BIO-MM#62: Prepare Plan for Dewatering and Water Diversions
 - BIO-MM#63: Work Stoppage
 - BIO-MM#66: Implement Avoidance Measures for Active Eagle Nests
 - BIO-MM#68: Avoid and Minimize Impacts on White-Tailed Kite

- BIO-MM#69: Conduct Surveys and Implement Avoidance Measures for Active Tricolored Blackbird Nest Colonies
- BIO-MM#71: Implement California Condor Avoidance Measures during Helicopter Use
- BIO-MM#72: Implement Avoidance of Nighttime Light Disturbance for California Condor
- BIO-MM#74: Implement Bird Nest and Avian Special Status Species Avoidance Measures for Helicopter-Based Construction Activities
- BIO-MM#76: Implement Wildlife Rescue Measures
- BIO-MM#86: Implement Lighting Minimization Measures During Construction
- **Mammals**
 - BIO-MM#22: Conduct Pre-Construction Surveys for Nelson’s Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse
 - BIO-MM#23: Implement Avoidance and Minimization Measures for Nelson’s Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse
 - BIO-MM#25: Conduct Pre-Construction Surveys for Special-Status Bat Species
 - BIO-MM#26: Implement Bat Avoidance and Relocation Measures
 - BIO-MM#27: Implement Bat Exclusion and Deterrence Measures
 - BIO-MM#28: Conduct Pre-Construction Surveys for Ringtail and Ringtail Den Sites and Implement Avoidance Measures
 - BIO-MM#29: Conduct Pre-Construction Surveys for American Badger Den Sites and Implement Minimization Measures
 - BIO-MM#30: Conduct Pre-Construction Surveys for San Joaquin Kit Fox
 - BIO-MM#31: Minimize Impacts on San Joaquin Kit Fox
 - BIO-MM#36: Install Aprons or Barriers within Security Fencing
 - BIO-MM#56: Conduct Monitoring of Construction Activities
 - BIO-MM#58: Establish Environmentally Sensitive Areas and Non-Disturbance Zones
 - BIO-MM#60: Limit Vehicle Traffic and Construction Site Speeds
 - BIO-MM#61: Establish and Implement a Compliance Reporting Program
 - BIO-MM#62: Prepare Plan for Dewatering and Water Diversions
 - BIO-MM#63: Work Stoppage
 - BIO-MM#76: Implement Wildlife Rescue Measures
 - BIO-MM#77: Implement Wildlife Height Requirements for Enhanced Security Fencing
 - BIO-MM#78: Install Wildlife Jump-Outs
 - BIO-MM#84: Conduct Pre-Construction Surveys and Implement Avoidance and Minimization Measures for Mountain Lion Dens
 - BIO-MM#86: Implement Lighting Minimization Measures During Construction

The measures outlined above would allow for the removal or exclusion of special-status wildlife species from the construction site prior to ground disturbance. In the case of fully protected terrestrial species (i.e., the blunt-nosed leopard lizard and ringtail), capture is not authorized and “removal” must be passive (BIO-MM#11, BIO-MM#13, and BIO-MM#28). Other fully protected species are birds, which naturally avoid humans in close proximity; however, the curiosity of the California condor may

lead to a situation where hazing in accordance with USFWS approved methods, which is not considered take, is appropriate per the mitigation measures provided in 3.7.7.

The following compensatory mitigation measures would allow for on-site and off-site habitat restoration and preservation of special-status wildlife species:

- BIO-MM#42: Provide Compensatory Mitigation for Impacts on Habitat for Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel
- BIO-MM#43: Provide Compensatory Mitigation for Loss of Swainson's Hawk Nesting Trees and Habitat
- BIO-MM#44: Provide Compensatory Mitigation for Loss of Active Burrowing Owl Burrows and Habitat
- BIO-MM#47: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts on Aquatic Resources
- BIO-MM#50: Implement Measures to Minimize Impacts during Off-Site Habitat Restoration, or Enhancement, or Creation on Mitigation Sites
- BIO-MM#53: Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat
- BIO-MM#67: Provide Compensatory Mitigation for Loss of Eagle Nests
- BIO-MM#70: Provide Compensatory Mitigation for Impacts on Tricolored Blackbird Habitat
- BIO-MM#81: Provide Compensatory Mitigation for Impacts on Crotch Bumble Bee
- BIO-MM#83: Provide Compensatory Mitigation for Impacts on Monarch Butterfly Breeding and Foraging Habitat
- BIO-MM#85: Provide Compensatory Mitigation for Impacts on Mountain Lion Core and Patch Habitat

These measures would work together with design features to minimize or avoid impacts on special-status wildlife species. Additional measures, such as the following, would further mitigate and minimize impacts on special-status wildlife species by removing nonnative species that would compete for habitat, and would provide for ongoing monitoring and reporting efforts.

- BIO-MM#55: Prepare and Implement a Weed Control Plan
- BIO-MM#56: Conduct Monitoring of Construction Activities
- BIO-MM#58: Establish Environmentally Sensitive Areas and Non-Disturbance Zones
- BIO-MM#60: Limit Vehicle Traffic and Construction Site Speeds
- BIO-MM#61: Establish and Implement a Compliance Reporting Program
- BIO-MM#62: Prepare Plan for Dewatering and Water Diversions
- BIO-MM#63: Work Stoppage

The Authority would use all measures to avoid species during construction activities. With regard to special-status wildlife species discussed in this section, impacts would be avoided, minimized and mitigated through mitigation measures that would require the Authority to minimize impacts and provide restoration, enhancement, and/or preservation after construction is completed.

Therefore, during construction of the B-P Build Alternatives, impacts on special-status wildlife species would be reduced and considered less than significant under CEQA after the implementation of mitigation measures identified above and in Section 3.7.7. Because these mitigation measures would provide for on-site and off-site habitat restoration and preservation of special-status wildlife species in an amount equivalent to or greater than the area impacted by the B-P Build Alternatives, no substantial adverse effect would occur, either directly or through habitat modifications. For wide-ranging, multi-habitat species, such as the golden eagle, the preservation and restoration for all of the other special status animal species would provide extensive habitat conservation in areas that are currently degraded or not conserved, thus ensuring preservation of habitat that would continue to support these species in the future.

Impact BIO #5: Construction Impacts on Wildlife Movement

Temporary

Direct impacts from placement of temporary barriers (e.g., temporary fencing), construction staging areas, increased vehicular traffic, or construction laydown within natural lands and known linkages may affect the ability of wildlife (both special-status and common wildlife species) to move freely. Further, noise, vibrations, light, dust, or human disturbance within construction areas may dissuade wildlife from using those areas for daily or seasonal movement or foraging. These direct impacts could permanently alter historical migration corridors, territories, or foraging habitats. However, because these are temporary impacts, it is likely that wildlife could alter their normal functions for the duration of project construction and then reestablish these functions once all temporary construction activities have been removed.

The activities listed above may also result in indirect impacts on wildlife movement, including habitat shifts, increased foraging competition, or genetic isolation of populations. However, these indirect impacts are unlikely to last if wildlife reestablishes movement patterns and habitat use once all temporary construction activities have been completed and all equipment has been removed.

Permanent

Direct impacts from installation of track segments, road crossing stations, maintenance facilities, or electrical substations may affect wildlife movement or generally alter the effectiveness of existing wildlife movement corridors, and physical barriers, such as fencing, could hinder wildlife movement through normal ranges or along migration routes. The segment of the HSR system between the towns of Cameron and Mojave would diverge from SR 58 and cut across the Mojave Desert before rejoining SR 14. This would represent a new barrier in an already fragmented portion of the Mojave Desert. Wildlife undercrossing or overcrossing structures that would be incorporated into the project's design would ameliorate this effect, depending on their placement and eventual usage. Building structures could also hinder movement depending on their location and size; however, these facilities are generally located within previously developed areas, and wildlife would probably avoid such structures by moving around them. Indirect impacts from installation of track, fencing, and building structures may include the alteration of long-term movement, foraging ranges, and genetic distribution of a species. Specifically, linear obstacles, such as track and fencing, may prevent wildlife from moving throughout their ranges during daily foraging, migration, or the breeding season. This could result in habitat fragmentation, habitat shifts, increased foraging competition, or limitations on genetic exchange. However, the construction of tunnels and viaducts, particularly in the mountainous areas, would allow for continued wildlife movement over and under the alignments. In addition, wildlife undercrossings and overcrossings would be installed along the length of the track. This would further reduce the impacts on normal wildlife movement throughout ranges. However, wildlife crossing effectiveness would depend on wildlife usage and continual maintenance of the structures.

As part of the B-P Build Alternatives and both CCNM Design Options, the project would minimize impacts on wildlife movement through the incorporation of tunnels and viaducts into the design that allow wildlife to freely move over or under the alignment. In addition, the design incorporates 39 wildlife crossings, including 27 small undercrossings (6-foot arch), 3 medium undercrossings (10-foot arch), 5 dual-use road undercrossings (combined road and wildlife undercrossing), 2 dual-use drainage overcrossings (synonymous with the term "overheads") (combined drainage and wildlife overcrossing), 1 dual-use road overcrossing (combined road and wildlife overcrossing), and 1 overcrossing. The wildlife crossings were located to maintain permeability through the at-grade segments throughout the Project Section consistent with *Wildlife Crossing Structure Handbook* (Clevenger and Huijser 2009) and *Wildlife Crossings Guidance Manual* (Meese et al. 2009) recommendations where feasible. Of the 39 wildlife crossings, eight of the crossings are within the Tehachapi linkage.

In addition, BIO-IAMF#1 through BIO-IAMF#3 and BIO-IAMF#5 through BIO-IAMF#11 include measures to minimize impacts on biological resources and wildlife connectivity from project construction and operation, as applicable and discussed in Section 3.7.4.2. The Authority would incorporate these IAMFs to reduce and minimize impacts by designating a project biologist and species-specific and general biological monitors during construction (BIO-IAMF#1). In addition,

the Authority would develop and implement a BRMP to identify special-status species and their habitat to be avoided during construction (BIO-IAMF#5). The BRMP would be a compilation of the biological resources avoidance and minimization measures applicable to the project section and other project environmental plans, such as the RPP and WCP. In addition, implementing BIO-IAMF#8 would minimize impacts on wildlife movement corridors by requiring the Authority to identify sensitive biological resources, including habitat for special-status species, seasonal wetlands, and wildlife movement corridors, and flagging and marking construction staging areas and access routes to ensure that vehicle traffic within the project footprint is restricted to established roads, construction areas, and other designated areas. Under all of the B-P Build Alternatives, the Authority would require construction crews to attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including wildlife crossings (BIO-IAMF#3). This would avoid some (but not all) direct impacts on wildlife crossings and habitat linkages because it would establish that contractors must be aware of and avoid affecting these areas during construction. In addition, HYD-IAMF#1 and HYD-IAMF#2 would be implemented. HYD-IAMF#1 addresses stormwater management and requires that a plan for management and treatment be prepared prior to construction. HYD-IAMF#2 requires preparation of a flood protection plan prior to construction.

Additionally, specific wildlife movement features were developed to address impacts on wildlife movement that were not covered by the general biological IAMFs. These wildlife movement-IAMFs include WM-IAMF#1: Impediments to Movement, WM-IAMF#2: Night Lighting, WM-IAMF#3: Construction Noise, WM-IAMF#4: Wildlife Exclusion Fencing, WM-IAMF#5: Vehicle Traffic, and WM-IAMF#6: Restoration and Revegetation Plan for Wildlife Movement Corridors. These IAMFs can be found in the Wildlife Corridor Analysis (Appendix I of the *Biological and Aquatic Resources Technical Report*).

CEQA Conclusion

Based on the CEQA thresholds identified in Section 3.7.4.7, the impact under CEQA to wildlife crossings and habitat linkages would be potentially significant under any of the B-P Build Alternatives and both CCNM Design Options. This determination is because disturbance of wildlife crossings and habitat for construction access and activities could interfere substantially with the movement of native wildlife species.

The design characteristics of the B-P Build Alternatives, and both CCNM Design Options, include effective IAMFs to identify wildlife crossings and delineate ESAs or environmentally restricted areas on final construction plans and in the field (BIO-IAMF#8 and BIO-IAMF#5). These measures minimize, but do not avoid, the potential impact on wildlife crossings from construction activities. Therefore, effective mitigation measures have been identified in Section 3.7.7 to reduce impacts on wildlife crossings and habitat linkages to a less than significant level by avoidance, protection, or restoration methods. These measures include: BIO-MM#42, BIO-MM#37, BIO-MM#56, BIO-MM#64, BIO-MM#77, BIO-MM#78, and BIO-MM#86, which would allow for the protection of habitat linkages. These measures would work together with design features to minimize or avoid impacts on wildlife crossings during construction activities so as not to interfere substantially with the movement of native wildlife species. Therefore, impacts would be considered less than significant under CEQA after implementation of BIO-MM#42, BIO-MM#37, BIO-MM#56, BIO-MM#64, BIO-MM#77, BIO-MM#78, and BIO-MM#86. No substantial adverse effect would occur, either directly or indirectly.

3.7.6.5 Operations Impacts

Impact BIO #8: Operational Impacts on Special-Status Wildlife Species

Potential temporary and permanent impacts on special-status wildlife species that may result from project O&M activities are described in the subsections below. Temporary operational impacts may occur as a result of activities along the project infrastructure that would occur infrequently or on a temporary basis. In general, those impacts would be restricted to access roads and project infrastructure; therefore, impacts on special-status wildlife would be minimal. Permanent operational impacts, which include frequent noise, light, vibration, and the high wind speeds and turbulence generated by a train moving up to 220 miles per hour, may occur on a

daily basis from operation of the HSR system. Permanent operational impacts are in addition to the permanent presence of project infrastructure, which are discussed under permanent construction impacts. However, operational impacts can only be described qualitatively.

Table 3.7-6 provides a comparison of estimated potential impacts on suitable habitat for special-status wildlife species within the RSA. Additionally, Table 3.7-7 outlines the results of the habitat species modeling approach used to address potential impacts on federally and state-listed species.

Amphibians, Reptiles, and Insects

If operations and/or maintenance activities are required in areas of suitable habitat for special-status amphibians, reptiles, and/or insects, direct impacts could include the incidental trampling or crushing of individuals by maintenance vehicles or equipment and the temporary disturbance of habitat. Noise, dust, and increased vibration may also directly affect amphibian and reptile species.

The security fencing would likely not prohibit most amphibian, reptile, or insect species from accessing the right-of-way, and direct impacts from train operations could include injury or mortality associated with direct strikes with the train itself. Therefore, as described in the mitigation measures, in areas of suitable habitat for various amphibians and reptiles, buried sheathing with fencing would be installed to deter those animals from entering the alignment right-of-way. The wildlife exclusion fencing shall incorporate a lower component consisting of a corrosion-resistant metal, with no larger than 0.5-inch mesh. This component of the fence shall extend from a minimum of 24 inches below the ground surface to 48 inches above the ground. With the exception of nighttime lighting, direct impacts on most species from train operations are not anticipated.

Indirect impacts on amphibians and reptiles could include increased predation from birds, such as raptors and corvids, as a result of the new artificial perch sites created by the project (i.e., project components such as security fencing, electrical infrastructure, and elevated structures). Maintenance vehicles may facilitate the spread of invasive plant species, which could reduce habitat suitability for special-status species.

Birds (Including Migratory Birds Covered under the Migratory Bird Treaty Act and California Fish and Game Code)

Direct impacts from maintenance activities (e.g., mowing, weed control) could include the removal or disturbance of areas that provide potential nesting habitat for a diverse population of birds. Potential disturbance includes noise and vibration associated with maintenance activities and equipment use. Maintenance activities conducted in areas of nesting habitat during the breeding season (generally between February 1 and September 1) could disturb nesting birds. This disturbance could cause nest abandonment and subsequent loss of eggs or developing young at active nests in or near the area of activity.

Direct impacts from project O&M could include injury or mortality from bird interactions such as electrocution and strikes/collisions. Regular train operations may reduce the suitability of nesting habitat adjacent to the HSR alignment, and maintenance activities may result in disturbance of nesting birds, resulting in nest abandonment, or may result in the trampling of nests on the ground or underground. Indirect impacts may occur if maintenance vehicles facilitate the spread of invasive plant species, which may reduce habitat suitability for these species.

Mammals

Direct impacts from O&M activities could include the injury or mortality of individuals from maintenance vehicles or equipment, electrocution associated with power supply lines, and strikes/collisions with new structures, especially in the case of bats. Driving off established roadways or along unpaved access roads could collapse burrows and injure or kill mammal individuals. Noise, dust, and increased vibration may also indirectly affect mammal species.

Indirect impacts from noise, vibration, and wind could result in the displacement of mammal species. These impacts may result in shifts in foraging patterns or territories, shifts in dispersal movements, increased predation, decreased reproductive success, and reduced population viability.

Indirect impacts could result from project components such as security fencing. Mammals may become ensnared or stuck on fences, or cornered by predators (e.g., coyotes, domestic/wild dogs) while traveling parallel to fence lines. Additionally, ongoing operation activities and increased human presence could influence species distribution.

Native Fauna

Direct and indirect impacts for other native fauna (e.g., insects, mollusks, crustaceans, amphibians, reptiles, fish, birds, and mammals) would be similar to those impacts described above for special-status wildlife species.

As part of the B-P Build Alternatives, Section 3.7.4.2 discusses IAMFs that would be incorporated to avoid and/or minimize impacts on biological and aquatic resources from project construction and operation. Specifically for operations impacts, BIO-IAMF#4 would require the Authority to ensure that maintenance personnel attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including special-status wildlife species. Wildlife species would also be protected under a flood protection plan by the Authority's hydrology IAMFs (HYD-IAMF#2).

CEQA Conclusion

Under any of the B-P Build Alternatives, the impact under CEQA would be potentially significant because of the potential for habitat degradation or modifications during maintenance activities, which could cause a substantial adverse effect on special-status wildlife species in areas that did not previously have this type of disturbance. The design characteristics of the B-P Build Alternatives include effective mitigation, including the relocation of special-status wildlife species within the project footprint during construction with agency approval, and habitat would be removed during construction within at-grade portions of the alignment. Therefore, most of the IAMFs and mitigation measures identified in this document would not be directly applicable during operation. However, there are mitigation measures that have been identified in Section 3.7.7 to reduce impacts during operation. These mitigation measures (listed below) use effective methods to identify and avoid special-status wildlife species during maintenance activities and operation of the B-P Build Alternatives.

- **Amphibians, Reptiles, and Insects**

- BIO-MM#36: Install Aprons or Barriers within Security Fencing
- BIO-MM#42: Provide Compensatory Mitigation for Impacts on Habitat for Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel
- BIO-MM#47: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts on Aquatic Resources
- BIO-MM#50: Implement Measures to Minimize Impacts during Off-Site Habitat Restoration, or Enhancement, or Creation on Mitigation Sites
- BIO-MM#53: Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat
- BIO-MM#79: Mitigation for Desert Tortoise
- BIO-MM#81: Provide Compensatory Mitigation for Impacts on Crotch Bumble Bee
- BIO-MM#83: Provide Compensatory Mitigation for Impacts on Monarch Butterfly Breeding and Foraging Habitat
- BIO-MM#87: Implement Lighting Minimization Measures for Operations

- **Birds (Including Migratory Birds Protected by California Fish and Game Code)**
 - BIO-MM#16: Implement Avoidance Measures for California Condor
 - BIO-MM#43: Provide Compensatory Mitigation for Loss of Swainson's Hawk Nesting Trees and Habitat
 - BIO-MM#44: Provide Compensatory Mitigation for Loss of Active Burrowing Owl Burrows and Habitat
 - BIO-MM#47: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts on Aquatic Resources
 - BIO-MM#50: Implement Measures to Minimize Impacts during Off-Site Habitat Restoration, or Enhancement, or Creation on Mitigation Sites
 - BIO-MM#53: Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat
 - BIO-MM#67: Provide Compensatory Mitigation for Loss of Eagle Nests
 - BIO-MM#70: Provide Compensatory Mitigation for Impacts on Tricolored Blackbird Habitat
 - BIO-MM#71: Implement California Condor Avoidance Measures during Helicopter Use
 - BIO-MM#73: Implement Removal of Carrion that May Attract Condors and Eagles
 - BIO-MM#76: Implement Wildlife Rescue Measures
 - BIO-MM#87: Implement Lighting Minimization Measures for Operations
- **Mammals**
 - BIO-MM#36: Install Aprons or Barriers within Security Fencing
 - BIO-MM#42: Provide Compensatory Mitigation for Impacts on Habitat for Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel
 - BIO-MM#45: Provide Compensatory Mitigation for Impacts on San Joaquin Kit Fox Habitat
 - BIO-MM#47: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts on Aquatic Resources
 - BIO-MM#53: Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat
 - BIO-MM#56: Conduct Monitoring of Construction Activities
 - BIO-MM#76: Implement Wildlife Rescue Measures
 - BIO-MM#77: Implement Wildlife Height Requirements for Enhanced Security Fencing
 - BIO-MM#78: Install Wildlife Jump-outs
 - BIO-MM#85: Provide Compensatory Mitigation for Impacts on Mountain Lion Core and Patch Habitat
 - BIO-MM#87: Implement Lighting Minimization Measures for Operations

These measures would work together with design features to minimize or avoid impacts on special-status wildlife species and to provide for on-site and off-site habitat restoration and preservation of special-status wildlife species in an amount equivalent to or greater than the area impacted by the B-P Build Alternatives during both construction and operation.

In addition, the following measure would further mitigate and minimize impacts on special-status wildlife species by removing nonnative plant species that would compete for the same habitat, and would provide ongoing monitoring and reporting of the WCP; BIO-MM#55: Prepare and Implement a Weed Control Plan.

Potential adverse impacts, such as electrocution and train strikes/collisions, could occur on wildlife species. These are of particular concern for Fully Protected species such as the California condor and the blunt-nosed leopard lizard, because “take” of these species cannot be authorized. Per the APLIC guidance, phased conductors would be designed a minimum of 10 feet apart in order to reduce the potential for California condor collision to a low probability. Additionally, exclusionary fencing would be permanently installed along any portion of the permanent right-of-way that is adjacent to natural habitats (e.g., alkali desert scrub, annual grassland) and would be enhanced with a barrier (e.g., fine mesh fencing) that extends at least 12 inches below ground and 12 inches aboveground to prevent blunt-nosed leopard lizard from accessing the right-of-way in order to reduce the potential for mortality to a low probability.

Therefore, mitigation measures are designed to prevent such impacts resulting from operation of the B-P Build Alternatives. These measures are: BIO-MM#16, BIO-MM#36, BIO-MM#42, BIO-MM#44, BIO-MM#45, BIO-MM#47, BIO-MM#50, BIO-MM#53, BIO-MM#56, BIO-MM#67, BIO-MM#71, BIO-MM#73, BIO-MM#76, BIO-MM#77, BIO-MM#78, BIO-MM#83, BIO-MM#85, and BIO-MM#87. These measures would avoid or mitigate impacts through restoration, enhancement, and/or preservation methods during O&M activities. The Authority would use these avoidance and minimization measures to protect all wildlife species discussed in this section.

Therefore, impacts during maintenance activities and operation would be reduced and considered less than significant under CEQA.

Impact BIO #11: Operation Impacts on Wildlife Movement

Temporary

Maintenance or any other activities along the project infrastructure that would occur infrequently or on a temporary basis may directly affect wildlife crossings by limiting their use by wildlife. Occasional project maintenance activities would likely cause wildlife to avoid the maintenance area, causing wildlife to abort crossing attempts and either turn back, attempt crossing return at a later time, or attempt to locate another crossing.

Intermittent maintenance activities are unlikely to have a long-term effect on wildlife movement corridors in terms of their effectiveness for gene flow and dispersion. For the reasons mentioned above, minor indirect impacts on foraging and other localized activities may occur.

Permanent

Direct impacts from daily train operation or regularly scheduled maintenance activities may interfere with wildlife movement between habitats. Regularly passing trains may not provide enough undisturbed time between passes, thus causing wildlife to discontinue use of some or all crossing structures. Regularly scheduled maintenance activities at specific sites may deter wildlife from approaching those areas or using them as part of a wildlife movement corridor, as wildlife may associate them with human presence and disturbance.

Regular train operation or frequent maintenance activities may result in indirect impacts if they restrict movement within wildlife movement corridors. This could lead to a decrease in foraging habitat, restriction of gene flow, and habitat fragmentation. Regular maintenance at specific sites could similarly dissuade wildlife movement near these areas because they become associated with human presence and noise. If these sites are near wildlife crossings, movement through specific crossings could be obstructed, thus causing wildlife to turn back or find another undisturbed crossing. This result could lead to further habitat fragmentation, restricted movement within wildlife corridors, habitat shifts, increased foraging competition, and possibly increased predation near undisturbed crossings.

As part of the B-P Build Alternatives, Section 3.7.4.2 discusses IAMFs that would be incorporated to avoid and/or minimize impacts on biological and aquatic resources, including wildlife movement crossings, from project construction and operation. Specifically for operations impacts, BIO-IAMF#4 would require the Authority to ensure that maintenance personnel attend WEAP training and certify that they understand the regulatory agency requirements and procedures necessary to protect biological resources, including wildlife movement crossings and habitat

linkages. Wildlife movement crossings and habitat linkages would also be protected under a flood protection plan by the Authority's hydrology IAMFs (HYD-IAMF#2).

CEQA Conclusion

The design characteristics of the B-P Build Alternatives and both CCNM Design Options include effective IAMFs to minimize the impact on wildlife movement crossings and habitat linkages within the project footprint during construction. Most of these IAMFs would not be used during operation. Under the B-P Build Alternatives, the impact under CEQA would be potentially significant because potential disturbance of wildlife crossings and habitat linkages during maintenance activities could cause a substantial adverse effect to areas that did not previously have this type of disturbance. Therefore, mitigation measures have been identified in Section 3.7.7 to reduce impacts during operation. These measures include: BIO-MM#76, BIO-MM#77, BIO-MM#78, and BIO-MM#64, which would provide for the protection of habitat linkages. These measures would work together with design features to minimize, avoid, or mitigate impacts on wildlife movement during project operation.

Therefore, under the B-P Build Alternatives, after implementation of BIO-MM#64, BIO-MM#76, BIO-MM#77, BIO-MM#78, and BIO-MM#87, impacts on wildlife movement during maintenance and operation would be reduced and considered less than significant under CEQA.

3.7.7 Mitigation Measures

3.7.7.2 Mitigation Measures for Biological and Aquatic Resources

BIO-MM#37: Minimize Effects to Wildlife Movement Corridors during Construction

To the extent feasible, the Authority will avoid placing fencing, either temporarily or permanently, within known wildlife movement corridors in those portions of the alignment where the tracks are elevated (e.g., viaducts or bridges). The Authority will avoid conducting ground disturbing activities in wildlife movement corridors during nighttime hours, to the extent feasible, and will shield nighttime lighting to avoid illuminating wildlife movement corridors in circumstances where avoidance of such activities is not feasible. Steps to minimize lighting effects to wildlife movement corridors during construction will be consistent with BIO-MM#86: Implement Lighting Minimization Measures During Construction.

This mitigation measure is anticipated to be effective because it minimizes construction-related disturbance to terrestrial wildlife using established wildlife movement linkages. By limiting the amount of construction fencing and permanent fencing, the impacts on wildlife movement corridors would be reduced. Furthermore, by reducing the amount of light and noise where construction is required over linkages (e.g., stream crossings), individual animals would be less likely to avoid the area and alter their natural behavioral patterns.

Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#64: Establish Wildlife Crossings

The Authority will create dedicated wildlife crossings to accommodate wildlife movement across permanently fenced infrastructure (consistent with any wildlife corridor assessment prepared), where wildlife movement would be significantly reduced. Prior to final construction design the Project Biologist shall confirm appropriate placement and dimensions of wildlife crossings.

For terrestrial wildlife, all crossings will conform to the minimum spacing and dimensions identified in the Wildlife Corridor Assessment (Appendix I of the *Biological and Aquatic Resources Technical Report*), unless different dimensions are specified in authorizations issued under the ESA or CESA.

To the extent feasible, all wildlife crossings created specifically for terrestrial species will include the following features and design considerations:

- Native earthen bottom
- Ledges or tunnels will be incorporated into the design to facilitate safe passage of small mammals
- Unobstructed entrances (e.g., no riprap, energy dissipaters, grates), although vegetative cover, adjacent to and near the entrances of crossings, is permissible
- Openness and clear line of sight from end to end
- Year-round absence of water for a portion of the width of the crossing (i.e., no flowing water)
- Slight grade at approaches to prevent flooding
- Limited open space between crossing and cover/habitat
- Separation from human use areas (e.g., trails, multiuse undercrossings)
- Avoidance of artificial light at approaches to wildlife crossings (Steps to minimize lighting effects to wildlife crossings will be consistent with BIO-MM#86: Implement Lighting Minimization Measures During Construction, and BIO-MM#87: Implement Lighting Minimization Measures for Operations.)

In addition, the Authority will incorporate features to accommodate wildlife movement into the design of bridges and culverts that are replaced or modified as part of project construction, wherever feasible. Project Biologist review of final construction design for consistency with placement and dimensions of wildlife crossings will be verified in a memorandum provided to the Authority.

This mitigation measure is anticipated to be effective because it describes how to avoid affecting wildlife movement, and methods for creating new barrier-free areas. Fencing to prevent terrestrial wildlife from entering the railroad right-of-way, to reduce wildlife mortality, could obstruct wildlife crossings. Therefore, creating new barrier-free locations along the B-P Build Alternatives would minimize impacts on wildlife through the creation of new wildlife crossing structures near known wildlife corridors.

Implementation of this measure would not result in additional physical disturbance outside the project footprint. Therefore, there is no potential for secondary impacts on biological or other resources.

BIO-MM#82: Avoid Direct Impacts on Monarch Butterfly Host Plants

Prior to any ground-disturbing activities, the Project Biologist would survey for monarch butterfly larval host plants (native milkweed species) within suitable habitat. If host plants are found, the Project Biologist would conduct surveys for adult butterflies during the peak flight period for Southern California (approximately October 1 through March 15) to determine presence/absence or presence may be assumed. Where adult butterflies are present or assumed to be present, construction personnel would avoid host plants outside of permanent impact areas where feasible.

BIO-MM#83: Provide Compensatory Mitigation for Impacts on Monarch Butterfly Breeding and Foraging Habitat

The Authority would provide compensatory mitigation to offset impacts on breeding and foraging habitat for monarch butterfly at a ratio of 2 to 1. Compensatory mitigation could include one or more methods as described in BIO-MM#53.

BIO-MM#84: Conduct Pre-Construction Surveys and Implement Avoidance and Minimization Measures for Mountain Lion Dens

Prior to any ground-disturbing activity, regardless of the time of year, the Project Biologist would conduct pre-construction surveys for known or potential mountain lion dens within suitable habitat located within the work area and within 2,000 feet of the work area, where access is permitted. These surveys would be conducted no less than 14 days and no more than 30 days prior to the start of ground-disturbing activities in a work area.

The definition for known, and potential, mountain lion den types is as follows;

- **Known Den.** Any existing natural den or human-made structure that is used or has been used at any time in the past by a mountain lion. Evidence of use may include historical records; past or current radio telemetry or tracking study data; mountain lion sign, such as tracks, scat, and/or prey remains; or other reasonable proof that a given den is being or has been used by a mountain lion;
- **Potential Den.** Any thick vegetation, boulder piles, rocky outcrops, or undercut cliffs within the species' range for which available evidence is insufficient to conclude that it is being used or has been used by a mountain lion. Potential dens will include the following characteristics: 1) refuge from predators (coyotes, golden eagles, other mountain lions) or 2) shielding of the litter from heavy rain and hot sun.

The Project Biologist will use location-specific survey methods to identify known and potential dens. The survey method will consider topography, vegetation density, safety, and other factors. Surveys will be conducted by a qualified biologist (i.e., a biologist with demonstrated experience in mountain lion biology, identification, and survey techniques) and may involve the establishment of camera stations, scent stations, pedestrian surveys (looking for tracks, caches, etc.), or other appropriate methods. Survey methods used will be designed to avoid the disturbance of known or potential dens to the extent feasible.

If known, or potential, mountain lion dens are identified or observed during pre-construction surveys, mountain lion dens will be assumed to have kittens present until the Project Biologist can document that they are not present and/or that the den is not being used. A nondisturbance buffer of at least 2,000 feet will be established around the known or potential den until the Project Biologist can document and confirm that the den is not occupied. If the den is determined to be occupied, the 2,000-foot nondisturbance buffer will be maintained until the den is confirmed abandoned by the Project Biologist. Construction may proceed if the Project Biologist determines that the den is not being used by mountain lions. However, ground disturbance would be limited to those days between October 1 and January 31 within 2,000 feet of known or potential dens to the extent feasible. Mountain lions can breed year-round; however, most breeding activity and births occur during the spring and summer months between February 1 and September 30.

BIO-MM#85: Provide Compensatory Mitigation for Impacts on Mountain Lion Core and Patch Habitat

The Authority would provide compensatory mitigation for impacts on mountain lion core and patch habitat through the preservation of suitable habitat that is acceptable to CDFW. Habitat would be replaced at a minimum ratio of 2:1 for permanent impacts on breeding/foraging habitat and high-priority foraging and dispersal habitat, and at a ratio of 1:1 for low-priority foraging and dispersal habitat, unless a higher ratio is required by regulatory authorizations issued under the California Endangered Species Act. Compensatory mitigation would be provided using one or more of the methods described in BIO-MM#53 and would, where feasible and acceptable to CDFW, contribute to preserving important movement lands across the HSR alignment.

BIO-MM#86: Implement Lighting Minimization Measures During Construction

The Authority would avoid conducting ground-disturbing activities within known wildlife habitat during nighttime hours, to the extent feasible. If nighttime work is necessary, the Authority would minimize impacts to adjacent habitat by:

- Conducting nightwork only within the boundaries of previously disturbed, cleared and grubbed areas,
- Shielding and directing nighttime lighting to avoid illuminating wildlife habitat, including movement corridors,
- Using the minimum lighting levels approved by OSHA (29 CFR 1926.56) for general construction (i.e., 5 foot-candles or 54 lux),

- Minimizing the direction of construction vehicle headlights towards offsite locations and use low beams or turn off headlights when safety considerations permit, and
- Minimizing the duration of lighting by using remote monitoring systems or other methods to ensure security of the construction site during hours it is not in use.

BIO-MM#87: Implement Lighting Minimization Measures for Operations

To address the permanent and intermittent impacts from lighting, the Authority would implement measures to minimize the intensity and duration of operational lighting of permanent facilities (e.g., traction power facilities, radio sites, and maintenance facilities), as well as intermittent train lighting, to the extent feasible:

- Outdoor lighting at operational facilities would be consistent with minimum OSHA requirements established by 29 CFR 1926.56 when the facilities are in use. To the extent feasible, the Authority would minimize the duration of lighting at operational facilities by using methods other than lighting (e.g., remote monitoring systems), to ensure security of facilities during nighttime hours they are not in use,
- Nighttime lighting will have shields or cowls (or other device to limit lighting) installed to direct the light downward to reduce the standard luminous intensity distribution curve to contain the light to the boundaries of the Project site to the extent practicable,

Train headlights would use the minimum standard allowed by the FRA under 49 CFR 229.125 (a single headlight of at least 200,000 candelas) within non-tunnel portions of the Project Section.

3.7.8 NEPA Impacts Summary

Under NEPA, project impacts are evaluated based on the criteria of context, intensity, and duration (short- or long-term). An impact would be identified and described according to the effects caused by the project after consideration of the project IAMFs and mitigation measures as identified above in Sections 3.7.6.3 and 3.7.7. The effectiveness of measures to avoid, minimize, and/or mitigate impacts is considered in making significance determinations under NEPA. Thus, if a measure sufficiently mitigates an impact, the effect is not significant. Therefore, significance under NEPA is described as either an impact or no effect.

General indicators of significance, based on the guidelines or criteria in NEPA, CESA, FESA, and regulatory guidance from FRA, include:

- Potential modification or destruction of habitat, movement corridors, or breeding, feeding, and sheltering areas for endangered, threatened, rare, or other special-status species
- Potential measurable degradation of protected habitats, sensitive vegetation communities, wetlands, or other habitat areas identified in plans, policies, or regulations
- Potential loss of a substantial number of any species that could affect the abundance or diversity of that species beyond the level of normal variability
- Potential indirect impacts, both temporary and permanent, from excessive noise and vibration that elicits a negative response and avoidance behavior

Following is a summary of the NEPA determination of impacts and how those determinations were made.

Under the No Project Alternative, existing development trends affecting biological resources are expected to continue and to potentially degrade natural systems. Expanded development in the region would continue resulting in direct effects, including habitat loss, mortality from vehicle strikes, and indirect effects associated with habitat degradation from pollution, noise, and dust effects on special-status species and habitats; creation of barriers to wildlife movement; habitat fragmentation; and other effects. These effects would result in incremental regional impacts on biological resources. Given that some remaining biological resources are rare, imperiled, or otherwise already degraded at the regional scale, continued development in the area, and the resulting degradation of biological resources under the No Project Alternative, are considered an

adverse impact. However, ongoing and future conservation planning and regulatory controls have the potential to be a mechanism for maintaining a degree of biological resources within the RSA with regard to the ongoing development trend without installation of the HSR system.

The proposed B-P Build Alternatives for the Bakersfield to Palmdale Project Section would incorporate the IAMFs to minimize impacts on biological and aquatic resources. These IAMFs include pre-construction surveys; designated areas for staging, access, and construction materials; biological monitors; and the establishment of protocols to further avoid or minimize effects on biological and aquatic resources. The IAMFs are considered part of the project and are not the same as mitigation measures. The IAMFs are described in detail in Section 3.7.4.2.

In addition to various technical reports prepared for the Bakersfield to Palmdale Project Section, a Biological Assessment has been prepared and submitted to the USFWS for review. The Authority anticipates initiating formal Section 7 Consultation by early 2020. The Biological Assessment evaluates the potential adverse effects of the proposed action on species that are listed as endangered or threatened, that are proposed for listing as endangered or threatened, or that are candidates for listing as endangered or threatened under FESA, as well as designated or proposed critical habitats. Potential effects on federally listed species are evaluated in accordance with the legal requirements set forth in Section 7 of FESA (16 U.S.C. Sections 1531 et seq.).

After evaluating the potential effects of the proposed action, but prior to implementation of IAMFs and/or mitigation, the Authority has determined that the Bakersfield to Palmdale Project Section may affect, and is likely to adversely affect, the following species:

- Bakersfield cactus (*Opuntia basilaris* var. *treleasei* [*O. treleasei*])
- Kern primrose sphinx moth (*Euproserpinus euterpe*)
- Blunt-nosed leopard lizard (*Gambelia sila*) (Fully Protected)
- Desert tortoise (*Gopherus agassizii*)
- Yellow-billed cuckoo (Western Distinct Population Segment; *Coccyzus americanus*)
- Southwestern willow flycatcher (*Empidonax traillii extimus*)
- California condor (*Gymnogyps californianus*) (Fully Protected)
- Least Bell's vireo (*Vireo bellii pusillus*)
- Tipton kangaroo rat (*Dipodomys nitratooides nitratooides*)
- San Joaquin kit fox (*Vulpes macrotis mutica*)

Due to the finding of may affect, and is likely to adversely affect, the Authority will request initiation of formal consultation between with the USFWS in accordance with Section 7 of FESA, which could result in an Incidental Take Statement for the following species: Bakersfield cactus (only on federal lands), Kern primrose sphinx moth, desert tortoise, yellow-billed cuckoo, southwestern willow flycatcher, least Bell's vireo, Tipton kangaroo rat, and San Joaquin kit fox. Although project impacts during construction and operation may remain likely to adversely affect the blunt-nosed leopard lizard and the California condor, the Authority would implement IAMFs and mitigation measures to completely avoid these species, or wait until these species have moved to another area, before beginning construction in habitat areas. With implementation of the conservation measures discussed herein, the Authority intends to request concurrence from the USFWS regarding the determination that the proposed action would have no effect on critical habitat and may affect, but is not likely to adversely affect, California jewelflower, Kern mallow, San Joaquin woolly-threads, and San Joaquin adobe sunburst.

The species determination of effect and critical habitat determination from the Biological Assessment is shown below in Table 3.7-13.

Table 3.7-13 Summary of Effects for Federally Listed Species and Their Critical Habitat

Scientific Name Common Name	Federal Status ¹	Species Determination	Critical Habitat Determination
Plants			
<i>Caulanthus californicus</i> California jewelflower	FE	May affect, but is not likely to adversely affect	N/A
<i>Eremalche kernensis</i> Kern mallow	FE	May affect, but is not likely to adversely affect	N/A
<i>Monolopia congdonii</i> San Joaquin woolly-threads	FE	May affect, but is not likely to adversely affect	N/A
<i>Pseudobahia peirsonii</i> San Joaquin adobe sunburst	FT	May affect, but is not likely to adversely affect	N/A
<i>Opuntia basilaris</i> var. <i>treleasei</i> (<i>O. treleasei</i>) Bakersfield cactus	FE	May affect, and is likely to adversely affect	N/A
Invertebrates			
<i>Euproserpinus euterpe</i> Kern primrose sphinx moth	FT	May affect, and is likely to adversely affect	N/A
Reptiles			
<i>Gambelia sila</i> Blunt-nosed leopard lizard	FE, FP	May affect, and is likely to adversely affect	N/A
<i>Gopherus agassizii</i> Desert tortoise	FT	May affect, and is likely to adversely affect	No Effect
Birds			
<i>Coccyzus americanus</i> Yellow-billed cuckoo (Western Distinct Population Segment)	FT	May affect, and is likely to adversely affect	No Effect
<i>Empidonax traillii extimus</i> Southwestern willow flycatcher	FE	May affect, and is likely to adversely affect	No Effect
<i>Gymnogyps californianus</i> California condor	FE, FP	May affect, and is likely to adversely affect	No Effect
<i>Vireo bellii pusillus</i> Least Bell's vireo	FE	May affect, and is likely to adversely affect	No Effect
Mammals			
<i>Dipodomys nitratooides</i> Tipton kangaroo rat	FE	May affect, and is likely to adversely affect	N/A
<i>Vulpes macrotis mutica</i> San Joaquin kit fox	FE	May affect, and is likely to adversely affect	N/A

Source: California High-Speed Rail Authority, 2016

Status acronyms are FT= Federal Threatened, FE= Federal Endangered, FP= Fully Protected.

N/A = not applicable

Implementation of the IAMFs will allow the B-P Build Alternatives to be designed using known methods of avoidance and minimization efforts, such as pre-construction surveys; designated areas for staging, access, and construction; biological monitors; and the establishment of protocols, as outlined in Section 3.7.4.2, to further avoid or minimize impacts. These design features would reduce many of the adverse effects on biological and aquatic resources.

In addition, the B-P Build Alternatives would incorporate biological mitigation measures to further minimize impacts on special-status plant and wildlife species, habitats of concern, wildlife movement corridors, and protected trees, as outlined in detail in Section 3.7.7. These efforts would reduce adverse impacts by implementing the following measures.

- **Impact BIO #2:** Construction of the B-P Build Alternatives would disturb suitable habitat that has the potential to support special-status reptile, amphibian, and insect species, special-status bird species (including raptors), and special-status mammal species.
 - **BIO-MM#7:** Conduct Pre-Construction Surveys for Special-Status Reptile and Amphibian Species
 - **BIO-MM#8:** Implement Avoidance and Minimization Measures for Special-Status Reptile and Amphibian Species
 - **BIO-MM#11:** Conduct Surveys for Blunt-Nosed Leopard Lizard
 - **BIO-MM#13:** Implement Avoidance Measures for Blunt-Nosed Leopard Lizard
 - **BIO-MM#14:** Conduct Pre-Construction Surveys and Delineate Active Nest Buffers Exclusion Areas for Breeding Birds
 - **BIO-MM#15:** Conduct Pre-Construction Surveys and Monitoring for Raptors
 - **BIO-MM#16:** Implement Avoidance Measures for California Condor
 - **BIO-MM#17:** Conduct Surveys for Swainson's Hawk Nests and Implement Avoidance and Minimization Measures
 - **BIO-MM#18:** Implement Avoidance and Minimization Measures for Swainson's Hawk Nests
 - **BIO-MM#20:** Conduct Protocol Surveys for Burrowing Owls
 - **BIO-MM#21:** Implement Avoidance and Minimization Measures for Burrowing Owl
 - **BIO-MM#22:** Conduct Pre-Construction Surveys for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse
 - **BIO-MM#23:** Implement Avoidance and Minimization Measures for Nelson's Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse
 - **BIO-MM#25:** Conduct Pre-Construction Surveys for Special-Status Bat Species
 - **BIO-MM#26:** Conduct Pre-Construction Surveys for Special-Status Bat Species
 - **BIO-MM#27:** Implement Bat Exclusion and Deterrence Measures
 - **BIO-MM#28:** Conduct Pre-Construction Surveys for Ringtail and Ringtail Den Sites and Implement Avoidance Measures
 - **BIO-MM#29:** Conduct Pre-Construction Surveys for American Badger Den Sites and Implement Minimization Measures
 - **BIO-MM#30:** Conduct Pre-Construction Surveys for San Joaquin Kit Fox
 - **BIO-MM#31:** Minimize Impacts on San Joaquin Kit Fox
 - **BIO-MM#36:** Install Aprons or Barriers within Security Fencing

- **BIO-MM#42:** Provide Compensatory Mitigation for Impacts to Habitat for Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel
- **BIO-MM#43:** Provide Compensatory Mitigation for Loss of Swainson's Hawk Nesting Trees and Habitat
- **BIO-MM#44:** Provide Compensatory Mitigation for Loss of Active Burrowing Owl Burrows and Habitat
- **BIO-MM#47:** Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts to Aquatic Resources
- **BIO-MM#50:** Implement Measures to Minimize Impacts During Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites
- **BIO-MM#53:** Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat
- **BIO-MM#55:** Prepare and Implement a Weed Control Plan
- **BIO-MM#56:** Conduct Monitoring of Construction Activities
- **BIO-MM#58:** Establish Environmentally Sensitive Areas and Non-Disturbance Zones
- **BIO-MM#60:** Limit Vehicle Traffic and Construction Site Speeds
- **BIO-MM#61:** Establish and Implement a Compliance Reporting Program
- **BIO-MM#62:** Prepare Plan for Dewatering and Water Diversions
- **BIO-MM#63:** Work Stoppage
- **BIO-MM#66:** Implement Avoidance Measures for Active Eagle Nests
- **BIO-MM#67:** Provide Compensatory Mitigation for Loss of Eagle Nests
- **BIO-MM#68:** Avoid and Minimize Impacts to White-tailed kite
- **BIO-MM#69:** Conduct Surveys and Implement Avoidance Measures for Active Tricolored Blackbird Nest Colonies
- **BIO-MM#70:** Provide Compensatory Mitigation for Impacts on Tricolored Blackbird Habitat
- **BIO-MM#71:** Implement California Condor Avoidance Measures during Helicopter Use
- **BIO-MM#72:** Implement Avoidance of Nighttime Light Disturbance for California Condor
- **BIO-MM#74:** Implement Bird Nest and Avian Special Status Species Avoidance Measures for Helicopter-Based Construction Activities
- **BIO-MM#76:** Implement Wildlife Rescue Measures
- **BIO-MM#77:** Implement Wildlife Height Requirements for Enhanced Security Fencing
- **BIO-MM#78:** Install Wildlife Jump-outs
- **BIO-MM#79:** Mitigation for Desert Tortoise
- **BIO-MM#80:** Conduct Surveys and Implement Avoidance Measures for Crotch Bumblebee
- **BIO-MM#82:** Avoid Direct Impacts on Monarch Butterfly Host Plants
- **BIO-MM#83:** Provide Compensatory Mitigation for Impacts on Monarch Butterfly Breeding and Foraging Habitat
- **BIO-MM#84:** Conduct Pre-Construction Surveys and Implement Avoidance and Minimization Measures for Mountain Lion Dens

- **BIO-MM#85:** Provide Compensatory Mitigation for Impacts on Mountain Lion Core and Patch Habitat
- **BIO-MM#86:** Implement Lighting Minimization Measures During Construction
- **Impact BIO #8:** Project impacts and operation of the B-P Build Alternatives would disturb suitable habitat that has the potential to support special-status reptiles, amphibian, and insect species, special-status bird species (including raptors), and special-status mammal species.
 - **BIO-MM#36:** Install Aprons or Barriers within Security Fencing
 - **BIO-MM#42:** Provide Compensatory Mitigation for Impacts to Habitat for Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel
 - **BIO-MM#43:** Provide Compensatory Mitigation for Loss of Swainson's Hawk Nesting Trees and Habitat
 - **BIO-MM#44:** Provide Compensatory Mitigation for Loss of Active Burrowing Owl Burrows and Habitat
 - **BIO-MM#45:** Provide Compensatory Mitigation for Impacts to San Joaquin Kit Fox Habitat
 - **BIO-MM#47:** Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts to Aquatic Resources
 - **BIO-MM#50:** Implement Measures to Minimize Impacts during Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites
 - **BIO-MM#53:** Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat
 - **BIO-MM#55:** Prepare and Implement a Weed Control Plan
 - **BIO-MM#56:** Conduct Monitoring of Construction Activities
 - **BIO-MM#67:** Provide Compensatory Mitigation for Loss of Eagle Nests
 - **BIO-MM#70:** Provide Compensatory Mitigation for Impacts on Tricolored Blackbird Habitat
 - **BIO-MM#71:** Implement California Condor Avoidance Measures during Helicopter Use
 - **BIO-MM#73:** Implement Removal of Carrion that May Attract Condors and Eagles
 - **BIO-MM#76:** Implement Wildlife Rescue Measures
 - **BIO-MM#77:** Implement Wildlife Height Requirements for Enhanced Security Fencing
 - **BIO-MM#78:** Install Wildlife Jump-Outs
 - **BIO-MM#79:** Mitigation for Desert Tortoise
 - **BIO-MM#81:** Provide Compensatory Mitigation for Impacts on Crotch Bumblebee
 - **BIO-MM#83:** Provide Compensatory Mitigation for Impacts on Monarch Butterfly Breeding and Foraging Habitat
 - **BIO-MM#85:** Provide Compensatory Mitigation for Impacts on Mountain Lion Core and Patch Habitat
 - **BIO-MM#87:** Implement Lighting Minimization Measures for Operations

3.7.9 CEQA Significance Conclusions

As discussed previously in Section 3.7.4.7, mandatory findings of significance within CEQA Guidelines Section 15065 require the lead agency to determine whether a project may have a

significant effect on the environment where substantial evidence indicates that adverse impacts may occur to biological resources.

For the purposes of this project, the following thresholds were used to define a significant impact on biological resources. The project would result in a significant impact on biological resources if it would:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, or regulations, or by the CDFW or USFWS
- Have a substantial adverse effect on federally protected wetlands, as defined by CWA Section 404 (including seasonal wetlands, canals, ditches, lacustrine habitats, retention and detention basins, and seasonal riverine habitats) through direct removal, filling, hydrological interruption, indirect or cumulative effects, or other means
- Substantially reduce the habitat of a fish or wildlife species
- Cause a fish or wildlife population to drop below self-sustaining levels
- Threaten to eliminate a plant or animal community
- Substantially reduce the number or restrict the range of an endangered, rare, or threatened species
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance
- Conflict with the provisions of an adopted HCP, NCCP, or other approved local, regional, state, or federal HCP

Mandatory findings of significance within Section 15065 of the CEQA Guidelines require the lead agency to determine whether a project may have a significant effect on the environment where substantial evidence indicates that adverse impacts may occur to biological resources. The negative conditions are defined as:

- The project has the potential to substantially degrade the quality of the environment, reduce wildlife species habitat, cause wildlife populations to drop below self-sustaining levels, threaten to eliminate a plant or animal community, or substantially reduce or restrict the range of a listed species.
- The project has the potential to achieve short-term environmental goals to the disadvantage of long-term environmental goals.
- The project has environmental effects that are individually limited but cumulatively considerable.

General indicators of significance, based on guidelines or criteria in NEPA, CEQA, CWA, CESA, FESA, and regulatory guidance from the FRA, include:

- Potential modification or destruction of habitat, movement corridors, or breeding, feeding, and sheltering areas for endangered, threatened, rare, or other special-status species
- Potential measurable degradation of protected habitats, sensitive vegetation communities, wetlands, or other habitat areas identified in plans, policies, or regulations
- Potential loss of a substantial number of any species that could affect the abundance or diversity of that species beyond the level of normal variability

- Potential indirect impacts, both temporary and permanent, from excessive noise and vibration that elicits a negative response and avoidance behavior

Under the No Project Alternative, existing development trends affecting biological resources are expected to continue and to potentially further degrade natural systems. Expanded development in the region would continue to result in direct effects, including habitat loss and mortality from vehicle strikes, as well as indirect effects associated with habitat degradation from pollution, noise, vibration, and dust effects on special-status species and habitats; creation of barriers to wildlife movement; habitat fragmentation; and other effects. These effects would result in incremental regional impacts on biological resources. Given that the remaining biological resources are rare, imperiled, or otherwise already degraded at the regional scale, continued development in the area and the resulting degradation of biological resources under the No Project Alternative are considered a significant impact. However, ongoing and future conservation planning and regulatory controls are a mechanism for maintaining a degree of biological and natural resources within the RSA with the potential of mitigating impacts.

All of the B-P Build Alternatives would incorporate IAMFs equally to minimize impacts on biological and aquatic resources. These IAMFs include pre-construction surveys; designated staging, access, and construction areas; biological monitors; and establishment of protocols to further avoid or minimize impacts on biological and aquatic resources (e.g., special-status plant and wildlife species, habitats of concern, wildlife movement corridors, and protected trees). The IAMFs are described above in Section 3.7.4.2.

Mitigation measures have been identified, and are described above in Section 3.7.7, for potentially significant impacts that cannot be avoided or minimized adequately by refining project design. These mitigation measures would be incorporated in all four B-P Build Alternatives to reduce impacts on biological and aquatic resources to a less than significant level.

Implementation of the IAMFs will allow the B-P Build Alternatives to be designed using known methods of avoidance and minimization efforts, such as pre-construction surveys; designated areas for staging, access, and construction; biological monitors; and the establishment of protocols as outlined in Section 3.7.6.4, to further avoid or minimize impacts. These design features would reduce impacts from implementation of the project on biological and aquatic resources. In addition, based on incorporation of the project design features (e.g., dedicated wildlife movement structures) and addition of the compensatory mitigation sites, the significance conclusion for wildlife movement after mitigation would also be less than significant.

The B-P Build Alternatives would incorporate biological mitigation measures to further minimize impacts on special-status plant and wildlife species, habitats of concern, wildlife movement corridors, and protected trees, as outlined in detail in Section 3.7.7. The Authority would reduce significant impacts by implementing the mitigation measures identified for the B-P Build Alternatives as outlined in this document, to ensure that impacts would be less than significant under CEQA.

Table 3.7-14 summarizes the CEQA impacts, the associated mitigation measures, and the level of significance after mitigation. The table presents only the impacts that are significant under CEQA prior to mitigation. The determinations presented for each impact represent the impact of the entire Bakersfield to Palmdale Project Section.

Table 3.7-14 Summary of CEQA Significance Conclusions, Mitigation Measures, and Level of Significance after Mitigation

Impact	Impact Avoidance, Minimization Features	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Construction				
Special-Status Plant Species				
BIO #1: Construction of the B-P Build Alternatives would directly or indirectly impact suitable habitat that has the potential to support special-status plant species.	BIO-IAMF#1: Designate Project Biologist, Designated Biologists, Species-Specific Biological Monitors and General Biological Monitors	Potentially Significant	BIO-MM#1: Conduct Presence/Absence Pre-Construction Surveys for Special-Status Plant Species and Special-Status Plant Communities	Less than significant for all B-P Build Alternatives (including both CCNM Design Options)
	BIO-IAMF#3: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training		BIO-MM#2: Prepare and Implement Plan for Salvage and Relocation of Special-Status Plant Species	
	BIO-IAMF#5: Prepare and Implement a Biological Resources Management Plan		BIO-MM#6: Prepare and Implement a Restoration and Revegetation Plan	
	BIO-IAMF#6: Establish Monofilament Restrictions		BIO-MM#38: Compensate for Impacts to Listed Plant Species	
	BIO-IAMF#7: Prevent Entrapment in Construction Materials and Excavations		BIO-MM#47: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts to Aquatic Resources	
	BIO-IAMF#8: Delineate Equipment Staging Areas and Traffic Routes		BIO-MM#50: Implement Measures to Minimize Impacts during Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites	
	BIO-IAMF#9: Dispose of Construction Spoils and Waste		BIO-MM#53: Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat	
	BIO-IAMF#10: Clean Construction Equipment		BIO-MM#55: Prepare and Implement a Weed Control Plan	
	BIO-IAMF#11: Maintain Construction Sites		BIO-MM#56: Conduct Monitoring of Construction Activities	
	HYD-IAMF#1: Stormwater Management		BIO-MM#58: Establish Environmentally Sensitive Areas and Non-Disturbance Zones	
	HYD-IAMF#2: Flood Protection		BIO-MM#61: Establish and Implement a Compliance Reporting Program BIO-MM#75: Minimize Impacts on Kern Primrose Sphinx Moth Host Plants	

Impact	Impact Avoidance, Minimization Features	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Special-Status Wildlife Species				
<p>BIO #2: Construction of the B-P Build Alternatives would disturb suitable habitat that has the potential to support special-status reptile, amphibian species, and insect species.</p>	<p>BIO-IAMF#1: Designate Project Biologist, Designated Biologists, Species-Specific Biological Monitors and General Biological Monitors</p>	<p>Potentially Significant</p>	<p>BIO-MM#7: Conduct Pre-construction Surveys for Special-Status Reptile and Amphibian Species</p>	<p>Less than significant for all B-P Build Alternatives (including both CCNM Design Options)</p>
	<p>BIO-IAMF#2: Facilitate Agency Access</p>		<p>BIO-MM#8: Implement Avoidance and Minimization Measures for Special-Status Reptile and Amphibian Species</p>	
	<p>BIO-IAMF#3: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training</p>		<p>BIO-MM#11: Conduct Surveys for Blunt-Nosed Leopard Lizard</p>	
	<p>BIO-IAMF#4: Conduct Operation and Maintenance Period WEAP Training</p>		<p>BIO-MM#13: Implement Avoidance Measures for Blunt-Nosed Leopard Lizard</p>	
	<p>BIO-IAMF#5: Prepare and Implement a Biological Resources Management Plan</p>		<p>BIO-MM#36: Install Aprons or Barriers within Security Fencing</p>	
	<p>BIO-IAMF#6: Establish Monofilament Restrictions</p>		<p>BIO-MM#42: Provide Compensatory Mitigation for Impacts to Habitat for Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson’s Antelope Squirrel</p>	
	<p>BIO-IAMF#7: Prevent Entrapment in Construction Materials and Excavations</p>		<p>BIO-MM#47: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts to Aquatic Resources</p>	
	<p>BIO-IAMF#8: Delineate Equipment Staging Areas and Traffic Routes</p>		<p>BIO-MM#50: Implement Measures to Minimize Impacts during Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites</p>	
	<p>BIO-IAMF#9: Dispose of Construction Spoils and Waste</p>		<p>BIO-MM#53: Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat</p>	
	<p>BIO-IAMF#10: Clean Construction Equipment</p>		<p>BIO-MM#55: Prepare and Implement a Weed Control Plan</p>	
	<p>BIO-IAMF#11: Maintain Construction Sites</p>		<p>BIO-MM#58: Establish Environmentally Sensitive Areas and Non-Disturbance Zones</p>	
	<p>BIO-IAMF#12: Design the Project to be Bird Safe</p>		<p>BIO-MM#61: Establish and Implement a Compliance Reporting Program</p>	
	<p>HYD-IAMF#1: Stormwater Management</p>		<p>BIO-MM#62: Prepare Plan for Dewatering and Water Diversions</p>	
	<p>HYD-IAMF#2: Flood Protection</p>		<p>BIO-MM#63: Work Stoppage</p>	

Impact	Impact Avoidance, Minimization Features	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
			<p>BIO-MM#75: Minimize Impacts on Kern Primrose Sphinx Moth Host Plants</p> <p>BIO-MM#79: Mitigation for Desert Tortoise</p> <p>BIO-MM#80: Conduct Surveys and Implement Avoidance Measures for Crotch Bumblebee</p> <p>BIO-MM#82: Avoid Direct Impacts on Monarch Butterfly Host Plants</p> <p>BIO-MM#83: Provide Compensatory Mitigation for Impacts on Monarch Butterfly Breeding and Foraging Habitat</p> <p>BIO-MM#86: Implement Lighting Minimization Measures During Construction</p>	
<p>BIO #2: Construction of the B-P Build Alternatives would disturb suitable habitat that has the potential to support special-status bird species (including raptors).</p>	<p>BIO-IAMF#1: Designate Project Biologist, Designated Biologists, Species-Specific Biological Monitors and General Biological Monitors</p> <p>BIO-IAMF#2: Facilitate Agency Access</p> <p>BIO-IAMF#3: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training</p> <p>BIO-IAMF#5: Prepare and Implement a Biological Resources Management Plan</p> <p>BIO-IAMF#6: Establish Monofilament Restrictions</p> <p>BIO-IAMF#7: Prevent Entrapment in Construction Materials and Excavations</p> <p>BIO-IAMF#8: Delineate Equipment Staging Areas and Traffic Routes</p> <p>BIO-IAMF#9: Dispose of Construction Spoils and Waste</p> <p>BIO-IAMF#10: Clean Construction Equipment</p>	<p>Potentially Significant</p>	<p>BIO-MM#14: Conduct Pre-Construction Surveys and Delineate Active Nest Buffers Exclusion Areas for Breeding Birds</p> <p>BIO-MM#15: Conduct Pre-Construction Surveys and Monitoring for Raptors</p> <p>BIO-MM#16: Implement Avoidance Measures for California Condor</p> <p>BIO-MM#17: Conduct Surveys for Swainson’s Hawk Nests and Implement Avoidance and Minimization Measures</p> <p>BIO-MM#18: Implement Avoidance and Minimization Measures for Swainson’s Hawk Nests</p> <p>BIO-MM#20: Conduct Protocol Surveys for Burrowing Owls</p> <p>BIO-MM#21: Implement Avoidance and Minimization Measures for Burrowing Owl</p> <p>BIO-MM#43: Provide Compensatory Mitigation for Loss of Swainson’s Hawk Nesting Trees and Habitat</p> <p>BIO-MM#44: Provide Compensatory Mitigation for Loss of Active Burrowing Owl Burrows and Habitat</p>	<p>Less than significant for all B-P Build Alternatives (including both CCNM Design Options)</p>

Impact	Impact Avoidance, Minimization Features	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
	BIO-IAMF#11: Maintain Construction Sites		BIO-MM#47: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts to Aquatic Resources	
	BIO-IAMF#12: Design the Project to be Bird Safe		BIO-MM#50: Implement Measures to Minimize Impacts during Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites	
	HYD-IAMF#1: Stormwater Management		BIO-MM#53: Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat	
	HYD-IAMF#2: Flood Protection		BIO-MM#56: Conduct Monitoring of Construction Activities	
			BIO-MM#58: Establish Environmentally Sensitive Areas and Non-Disturbance Zones	
			BIO-MM#61: Establish and Implement a Compliance Reporting Program	
			BIO-MM#62: Prepare Plan for Dewatering and Water Diversions	
			BIO-MM#63: Work Stoppage	
			BIO-MM#66: Implement Avoidance Measures for Active Eagle Nests	
			BIO-MM#67: Provide Compensatory Mitigation for Loss of Eagle Nests	
			BIO-MM#68: Avoid and Minimize Impacts to White-Tailed Kite	
			BIO-MM#69: Conduct Surveys and Implement Avoidance Measures for Active Tricolored Blackbird Nest Colonies	
			BIO-MM#70: Provide Compensatory Mitigation for Impacts on Tricolored Blackbird Habitat	
			BIO-MM#71: Implement California Condor Avoidance Measures During Helicopter Use	
			BIO-MM#72: Implement Avoidance of Nighttime Light Disturbance for California Condor	
			BIO-MM#74: Implement Bird Nest and Avian Special Status Species Avoidance Measures for Helicopter-Based Construction Activities	
			BIO-MM#76: Implement Wildlife Rescue Measures	
		BIO-MM#86: Implement Lighting Minimization Measures During Construction		

Impact	Impact Avoidance, Minimization Features	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
<p>BIO #2: Construction of the B-P Build Alternatives would disturb suitable habitat that has the potential to support special-status mammal species.</p>	<p>BIO-IAMF#1: Designate Project Biologist, Designated Biologists, Species-Specific Biological Monitors and General Biological Monitors</p>	<p>Potentially Significant</p>	<p>BIO-MM#22: Conduct Pre-Construction Surveys for Nelson’s Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse</p>	<p>Less than significant for all B-P Build Alternatives (including both CCNM Design Options)</p>
	<p>BIO-IAMF#2: Facilitate Agency Access</p>		<p>BIO-MM#23: Implement Avoidance and Minimization Measures for Nelson’s Antelope Squirrel, Tipton Kangaroo Rat, Dulzura Pocket Mouse, and Tulare Grasshopper Mouse</p>	
	<p>BIO-IAMF#3: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training</p>		<p>BIO-MM#25: Conduct Pre-construction Surveys for Special-Status Bat Species</p>	
	<p>BIO-IAMF#5: Prepare and Implement a Biological Resources Management Plan</p>		<p>BIO-MM#26: Implement Bat Avoidance and Relocation Measures</p>	
	<p>BIO-IAMF#6: Establish Monofilament Restrictions</p>		<p>BIO-MM#27: Implement Bat Exclusion and Deterrence Measures</p>	
	<p>BIO-IAMF#7: Prevent Entrapment in Construction Materials and Excavations</p>		<p>BIO-MM#28: Conduct Pre-Construction Surveys for Ringtail and Ringtail Den Sites and Implement Avoidance Measures</p>	
	<p>BIO-IAMF#8: Delineate Equipment Staging Areas and Traffic Routes</p>		<p>BIO-MM#29: Conduct Pre-Construction Surveys for American Badger Den Sites and Implement Minimization Measures</p>	
	<p>BIO-IAMF#9: Dispose of Construction Spoils and Waste</p>		<p>BIO-MM#30: Conduct Pre-Construction Surveys for San Joaquin Kit Fox</p>	
	<p>BIO-IAMF#10: Clean Construction Equipment</p>		<p>BIO-MM#31: Minimize Impacts on San Joaquin Kit Fox</p>	
	<p>BIO-IAMF#11: Maintain Construction Sites</p>		<p>BIO-MM#36: Install Aprons or Barriers within Security Fencing</p>	
	<p>BIO-IAMF#12: Design the Project to Be Bird Safe</p>		<p>BIO-MM#42: Provide Compensatory Mitigation for Impacts to Habitat for Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson’s Antelope Squirrel</p>	
	<p>HYD-IAMF#1: Stormwater Management</p>		<p>BIO-MM#47: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts to Aquatic Resources</p>	
	<p>HYD-IAMF#2: Flood Protection</p>		<p>BIO-MM#50: Implement Measures to Minimize Impacts during Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites BIO-MM#53: Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat</p>	

Impact	Impact Avoidance, Minimization Features	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
			<p>BIO-MM#56: Conduct Monitoring of Construction Activities</p> <p>BIO-MM#58: Establish Environmentally Sensitive Areas and Non-Disturbance Zones</p> <p>BIO-MM#60: Limit Vehicle Traffic and Construction Site Speeds</p> <p>BIO-MM#61: Establish and Implement a Compliance Reporting Program</p> <p>BIO-MM#62: Prepare Plan for Dewatering and Water Diversions</p> <p>BIO-MM#63: Work Stoppage</p> <p>BIO-MM#76: Implement Wildlife Rescue Measures</p> <p>BIO-MM#77: Implement Wildlife Height Requirements for Enhanced Security Fencing</p> <p>BIO-MM#78: Install Wildlife Jump-Outs</p> <p>BIO-MM#84: Conduct Pre-Construction Surveys and Implement Avoidance and Minimization Measures for Mountain Lion Dens</p> <p>BIO-MM#85: Provide Compensatory Mitigation for Impacts on Mountain Lion Core and Patch Habitat</p> <p>BIO-MM#86: Implement Lighting Minimization Measures During Construction</p>	

Impact	Impact Avoidance, Minimization Features	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Habitats of Concern				
Special-Status Plant Communities				
BIO #3: Construction of the B-P Build Alternatives would disturb special-status plant communities and riparian areas.	BIO-IAMF#1: Designate Project Biologist, Designated Biologists, Species-Specific Biological Monitors and General Biological Monitors	Potentially Significant	BIO-MM#1: Conduct Presence/Absence Pre-Construction Surveys for Special-Status Plant Species and Special-Status Plant Communities	Less than significant for all B-P Build Alternatives (including both CCNM Design Options)
	BIO-IAMF#3: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training		BIO-MM#6: Prepare and Implement a Restoration and Revegetation Plan	
	BIO-IAMF#5: Prepare and Implement a Biological Resources Management Plan		BIO-MM#47: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts to Aquatic Resources	
	BIO-IAMF#6: Establish Monofilament Restrictions		BIO-MM#50: Implement Measures to Minimize Impacts during Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites	
	BIO-IAMF#7: Prevent Entrapment in Construction Materials and Excavations		BIO-MM#53: Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat	
	BIO-IAMF#9 Dispose of Construction Spoils and Waste		BIO-MM#54: Prepare and Implement an Annual Vegetation Control Plan	
			BIO-MM#58: Establish Environmentally Sensitive Areas and Non-Disturbance Zones	
			BIO-MM#61: Establish and Implement a Compliance Reporting Program	
	BIO-MM#75: Minimize Impacts on Kern Primrose Sphinx Moth Host Plants			

Impact	Impact Avoidance, Minimization Features	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Aquatic Resources				
BIO #4: Construction of the B-P Build Alternatives would have direct and indirect impacts on aquatic resources.	BIO-IAMF#3: Prepare WEAP Training Materials and Conduct Construction Period WEAP Training	Potentially Significant	BIO-MM#6: Prepare and Implement a Restoration and Revegetation Plan	Less than significant for all B-P Build Alternatives (including both CCNM Design Options)
	BIO-IAMF#5: Prepare and Implement a Biological Resources Management Plan		BIO-MM#33: Restore Aquatic Resources Subject to Temporary Impacts	
	BIO-IAMF#9: Dispose of Construction Spoils and Waste		BIO-MM#34: Monitor Construction Activities within Aquatic Resources	
	HYD-IAMF#1: Stormwater Management		BIO-MM#47: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts to Aquatic Resources	
	HYD-IAMF#2: Flood Protection		BIO-MM#50: Implement Measures to Minimize Impacts during Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites	
			BIO-MM#58: Establish Environmentally Sensitive Areas and Non-Disturbance Zones	
			BIO-MM#61: Establish and Implement a Compliance Reporting Program	
BIO-MM#62: Prepare Plan for Dewatering and Water Diversions				

Impact	Impact Avoidance, Minimization Features	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Wildlife Movement Corridors				
BIO #5: Project impacts from the B-P Build Alternatives would temporarily reduce the functionality of wildlife movement corridors and habitat linkages.	BIO-IAMF#1: Designate Project Biologist, Designated Biologists, Species-Specific Biological Monitors and General Biological Monitors	Potentially Significant	BIO-MM#36: Install Aprons or Barriers within Security Fencing	Less than significant for all B-P Build Alternatives (including both CCNM Design Options)
	BIO-IAMF#7: Prevent Entrapment in Construction Materials and Excavations		BIO-MM#37: Minimize Effects on Wildlife Movement Corridors During Construction	
	BIO-IAMF#8: Delineate Equipment Staging Areas and Traffic Routes		BIO-MM#50: : Implement Measures to Minimize Impacts during Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites	
	HYD-IAMF#1: Stormwater Management		BIO-MM#56: Conduct Monitoring of Construction Activities	
	HYD-IAMF#2: Flood Protection		BIO-MM#64: Establish Wildlife Crossings	
			BIO-MM#77: Implement Wildlife Height Requirements for Enhanced Security Fencing	
			BIO-MM#78: Install Wildlife Jump-outs	
	BIO-MM#86: Implement Lighting Minimization Measures During Construction			
Protected Trees				
BIO #6: Construction impacts from the B-P Build Alternatives would temporarily affect protected trees.	BIO-IAMF#1: Designate Project Biologist, Designated Biologists, Species-Specific Biological Monitors and General Biological Monitors	Potentially Significant	BIO-MM#35: Implement Transplantation and Compensatory Mitigation Measures for Protected Trees	Less than significant for all B-P Build Alternatives (including both CCNM Design Options)
	BIO-IAMF#7: Prevent Entrapment in Construction Materials and Excavations		BIO-MM#50: Implement Measures to Minimize Impacts during Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites	
	BIO-IAMF#11: Maintain Construction Sites		BIO-MM#56: Conduct Monitoring of Construction Activities	
	HYD-IAMF#1: Stormwater Management		BIO-MM#58: Establish Environmentally Sensitive Areas and Non-Disturbance Zones	
	HYD-IAMF#2: Flood Protection		BIO-MM#61: Establish and Implement a Compliance Reporting Program	

Impact	Impact Avoidance, Minimization Features	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Operation				
Special-Status Plant Species				
BIO #7: Construction of the B-P Build Alternatives would directly or indirectly impact suitable habitat that has the potential to support special-status plant species.	BIO-IAMF#4: Conduct Operation and Maintenance Period WEAP Training	Potentially Significant	BIO-MM#6: Prepare and Implement a Restoration and Revegetation Plan	Less than significant for all B-P Build Alternatives (including both CCNM Design Options)
	HYD-IAMF#1: Stormwater Management		BIO-MM#50: Implement Measures to Minimize Impacts During Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites	
	HYD-IAMF#2: Flood Protection		BIO-MM#53: Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat	
			BIO-MM#54: Prepare and Implement an Annual Vegetation Control Plan	
Special-Status Wildlife Species				
BIO #8: Project impacts from the B-P Build Alternatives would disturb suitable habitat that has the potential to support special-status reptile, amphibian, and insect species.	BIO-IAMF#4: Conduct Operation and Maintenance Period WEAP Training	Potentially Significant	BIO-MM#36: Install Aprons or Barriers within Security Fencing	Less than significant for all B-P Build Alternatives (including both CCNM Design Options)
	HYD-IAMF#1: Stormwater Management		BIO-MM#42: Provide Compensatory Mitigation for Impacts to Habitat for Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson's Antelope Squirrel	
	HYD-IAMF#2: Flood Protection		BIO-MM#47: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts to Aquatic Resources	
			BIO-MM#50: Implement Measures to Minimize Impacts during Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites	
			BIO-MM#53: Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat	
			BIO-MM#79: Mitigation for Desert Tortoise	
			BIO-MM#81: Provide Compensatory Mitigation for Impacts to Crotch Bumblebee	
			BIO-MM#83: Provide Compensatory Mitigation for Impacts on Monarch Butterfly Breeding and Foraging Habitat	
	BIO-MM#87: Implement Lighting Minimization Measures for Operations			

Impact	Impact Avoidance, Minimization Features	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
<p>BIO #8: Project impacts from the B-P Build Alternatives would permanently impact suitable habitat that has the potential to support special-status bird species.</p>	<p>BIO-IAMF#4: Conduct Operation and Maintenance Period WEAP Training</p>	<p>Potentially Significant</p>	<p>BIO-MM#43: Provide Compensatory Mitigation for Loss of Swainson’s Hawk Nesting Trees and Habitat</p>	<p>Less than significant for all B-P Build Alternatives (including both CCNM Design Options)</p>
	<p>HYD-IAMF#1: Stormwater Management</p>		<p>BIO-MM#44: Provide Compensatory Mitigation for Loss of Active Burrowing Owl Burrows and Habitat</p>	
	<p>HYD-IAMF#2: Flood Protection</p>		<p>BIO-MM#47: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts to Aquatic Resources</p>	
			<p>BIO-MM#50: Implement Measures to Minimize Impacts during Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites</p>	
			<p>BIO-MM#53: Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat</p>	
			<p>BIO-MM#67: Provide Compensatory Mitigation for Loss of Eagle Nests</p>	
			<p>BIO-MM#70: Provide Compensatory Mitigation for Impacts on Tricolored Blackbird Habitat</p>	
			<p>BIO-MM#71: Implement California Condor Avoidance Measures During Helicopter Use</p>	
			<p>BIO-MM#73: Implement Removal of Carrion that may Attract Condors and Eagles</p>	
			<p>BIO-MM#76: Implement Wildlife Rescue Measures</p>	
<p>BIO-MM#87: Implement Lighting Minimization Measures for Operations</p>				

Impact	Impact Avoidance, Minimization Features	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
<p>BIO #8: Project impacts from the B-P Build Alternatives would permanently impact suitable habitat that has the potential to support special-status mammal species.</p>	<p>BIO-IAMF#4: Conduct Operation and Maintenance Period WEAP Training</p>	<p>Potentially Significant</p>	<p>BIO-MM#36: Install Aprons or Barriers within Security Fencing</p>	<p>Less than significant for all B-P Build Alternatives (including both CCNM Design Options)</p>
	<p>HYD-IAMF#1: Stormwater Management</p>		<p>BIO-MM#42: Provide Compensatory Mitigation for Impacts to Habitat for Blunt-Nosed Leopard Lizard, Tipton Kangaroo Rat, and Nelson’s Antelope Squirrel</p>	
	<p>HYD-IAMF#2: Flood Protection</p>		<p>BIO-MM#45: Provide Compensatory Mitigation for Impacts to San Joaquin Kit Fox Habitat</p>	
	<p>BIO-MM#47: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts to Aquatic Resources</p>			
	<p>BIO-MM#50: Implement Measures to Minimize Impacts During Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites</p>			
	<p>BIO-MM#53: Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat</p>			
	<p>BIO-MM#76: Implement Wildlife Rescue Measures</p>			
	<p>BIO-MM#77: Implement Wildlife Height Requirements for Enhanced Security Fencing</p>			
	<p>BIO-MM#78: Install Wildlife Jump-outs</p>			
	<p>BIO-MM#85: Provide Compensatory Mitigation for Impacts on Mountain Lion Core and Patch Habitat</p>			
<p>BIO-MM#87: Implement Lighting Minimization Measures for Operations</p>				

Impact	Impact Avoidance, Minimization Features	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Habitats of Concern				
Special-Status Plant Communities				
BIO #9: Project impacts from the B-P Build Alternatives would permanently impact special-status plant communities and riparian areas.	BIO-IAMF#4: Conduct Operation and Maintenance Period WEAP Training	Potentially Significant	BIO-MM#6: Prepare and Implement a Restoration and Revegetation Plan	Less than significant for all B-P Build Alternatives (including both CCNM Design Options)
	HYD-IAMF#1: Stormwater Management		BIO-MM#32: Restore Temporary Riparian Habitat Impacts	
	HYD-IAMF#2: Flood Protection		BIO-MM#46: Provide Compensatory Mitigation for Permanent Impacts to Riparian Habitat	
			BIO-MM#47: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts to Aquatic Resources	
			BIO-MM#50: Implement Measures to Minimize Impacts during Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites	
			BIO-MM#53: Prepare a Compensatory Mitigation Plan (CMP) for Species and Species Habitat	
			BIO-MM#54: Prepare and Implement an Annual Vegetation Control Plan	
Aquatic Resources				
BIO #10: Project impacts from the B-P Build Alternatives would permanently affect aquatic resources.	BIO-IAMF#4: Conduct Operation and Maintenance Period WEAP Training	Potentially Significant	BIO-MM#6: Prepare and Implement a Restoration and Revegetation Plan	Less than significant for all B-P Build Alternatives (including both CCNM Design Options)
	HYD-IAMF#1: Stormwater Management		BIO-MM#33: Restore Aquatic Resources Subject to Temporary Impacts	
	HYD-IAMF#2: Flood Protection		BIO-MM#47: Prepare and Implement a Compensatory Mitigation Plan (CMP) for Impacts to Aquatic Resources	
			BIO-MM#50: Implement Measures to Minimize Impacts during Offsite Habitat Restoration	
	BIO-MM#58: Establish Environmentally Sensitive Areas and Non-Disturbance Zones, Enhancement, or Creation on Mitigation Sites			

Impact	Impact Avoidance, Minimization Features	Level of Significance before Mitigation	Mitigation Measure	Level of Significance after Mitigation
Wildlife Movement Corridors				
BIO #11: Project impacts from the B-P Build Alternatives would permanently reduce the functionality of wildlife movement corridors and habitat linkages.	BIO-IAMF#4: Conduct Operation and Maintenance Period WEAP Training	Potentially Significant	BIO-MM#64: Establish Wildlife Crossings	Less than significant for all B-P Build Alternatives (including both CCNM Design Options)
	HYD-IAMF#1: Stormwater Management		BIO-MM#76: Implement Wildlife Rescue Measures	
	HYD-IAMF#2: Flood Protection		BIO-MM#77: Implement Wildlife Height Requirements for Enhanced Security Fencing	
			BIO-MM#78: Install Wildlife Jump-Outs	
			BIO-MM#87: Implement Lighting Minimization Measures for Operations	
Protected Trees				
BIO #12: Project impacts from the B-P Build Alternatives would permanently affect protected trees.	BIO-IAMF#4: Conduct Operation and Maintenance Period WEAP Training	Potentially Significant	BIO-MM#35: Implement Transplantation and Compensatory Mitigation Measures for Protected Trees	Less than significant for all B-P Build Alternatives (including both CCNM Design Options)
	HYD-IAMF#1: Stormwater Management		BIO-MM#50: Implement Measures to Minimize Impacts during Offsite Habitat Restoration, or Enhancement, or Creation on Mitigation Sites	
	HYD-IAMF#2: Flood Protection			

Source: California High-Speed Rail Authority, 2016
 B-P = Bakersfield to Palmdale Project Section
 CCNM = César E. Chávez National Monument
 WEAP = Worker Environmental Awareness Program