Summary

This Specialist Report describes existing environmental conditions and analyzes environmental impacts related to Biological Resources that are expected to result from the implementation of Southern California Edison's (SCE's) proposed Tehachapi Renewable Transmission Project (TRTP). This report has been prepared in support of an Environmental Impact Report and Environmental Impact Statement (EIR/EIS) being prepared jointly by the California Public Utilities Commission (CPUC) and the USDA Forest Service (FS) for SCE's proposed TRTP.

Implementation of the proposed TRTP would require the approval of a Certificate of Public Convenience and Necessity by the CPUC and a Special Use authorization from the FS. Amendments to the Forest Land Management Plan (Forest Plan) would be required to allow the implementation of the TRTP across National Forest System (NFS) lands in the Angeles National Forest (ANF). Additional approvals and permits from other agencies would also be required and vary by alternative.

Impacts related to Biological Resources are evaluated for both the construction and operation of the proposed TRTP. Key issues related to Project construction and operations include the following:

- Temporary and/or permanent loss of natural communities (such as riparian and coastal sage scrub).
- Direct and indirect impacts to any species listed as endangered, threatened, or proposed or critical habitat for these species.
- Direct and indirect impacts to any species identified as a candidate, FS Sensitive, or special-status species.
- Direct and indirect impacts to federally protected wetlands.
- Interference with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or the use of native wildlife nursery sites.
- Conflicts with any local policies or ordinances protecting biological resources.
- Conflicts with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP.

Overview of the Project Purpose, Proposed Project/Action, and Alternatives

Below is an overview of the alternatives analyzed in this Specialist Report. Pursuant to CEQA (Guidelines Section 15126.6(a)) and NEPA (40 CFR 1505.1(e)), a reasonable range of alternatives to SCE's proposed project (Alternative 2) are examined in this Specialist Report, which were selected based on the following criteria: (1) the alternative's potential to meet most of the Project objectives/purpose and need; (2) the feasibility of the alternative; and (3) the alternative's ability to address significant environmental issues associated with SCE's proposed Project. As required under CEQA Section 15126.6(e) and NEPA Section 1502.14(d), a No Project/Action Alternative was also considered. The proposed Project and alternatives include the following:

Alternative 1: No Project/Action Alternative. Under the No Project/Action Alternative the Tehachapi Renewable Transmission Project, as proposed, would not be implemented. As such, none of the associated Project activities would occur and the environmental impacts associated specifically with the proposed Project would not occur. However, in the absence of the Project, SCE still would continue to operate and maintain the existing transmission structures, access, and spur roads for operations and maintenance purposes under a

variety of agreements (landowners) and permits (FS and US Army Corps of Engineers[USACE]). For example, within the ANF, approximately 80 miles of roads are currently being used to access the existing structures along Segments 6 and 11, which the use and maintenance of is authorized through existing roads permits issued by the FS. SCE would also be required to interconnect and integrate power generation facilities into its electric system, as required under Sections 210 and 212 of the Federal Power Act (16 U.S.C. § 824 [i] and [k]) and Sections 3.2 and 5.7 of the CAISO's Tariff. Various scenarios related to electricity generation and transmission are reasonably expected to occur in the foreseeable future and are identified in Section 2.1 of the EIR/EIS.

Alternative 2: SCE's Proposed Project. SCE's proposed Project would involve construction, operation, and maintenance of new and upgraded transmission infrastructure along approximately 173 miles of new and existing rights-of-way (ROW) from the Tehachapi Wind Resource Area (TWRA) in southern Kern County south through Los Angeles County and the Angeles National Forest (ANF) and east to the existing Mira Loma Substation in Ontario, San Bernardino County, California. The major components of SCE's proposed Project include the following:

- Build a new single-circuit 500-kV transmission line (T/L) traveling approximately 16.8 miles over new ROW between the approved Windhub Substation and the proposed new Whirlwind Substation (Segment 10).
- Build two new single-circuit 220-kV T/Ls for approximately four miles (travelling parallel) in new ROW between the proposed (not part of Project) Cottonwind Substation to the proposed new Whirlwind Substation (Segment 4 – 220 kV).
- Build a new single-circuit 500-kV T/L for approximately 15.6 miles in new ROW between the proposed new Whirlwind Substation to the existing Antelope Substation (Segment 4 – 500 kV).
- Replace approximately 17.4 miles of the existing Antelope-Vincent 220-kV T/L and the existing Antelope-Mesa 220-kV T/L with only one new T/L built to 500-kV standards in existing ROW between the existing Antelope and Vincent Substations (Segment 5).
- Rebuild approximately 18.7 miles of existing 220-kV T/L to 500-kV standards between the existing Vincent and Gould Substations and construct a new 220-kV circuit on the vacant side of the existing double-circuit structures of the Eagle Rock-Mesa 220-kV T/L between the existing Gould and Mesa Substations (Segment 11).
- Rebuild approximately 31.9 miles of existing 220-kV T/L to 500-kV standards from the existing Vincent Substation to the southern boundary of the ANF, including approximately 26.9 miles of the existing Antelope-Mesa 220-kV T/L and approximately five miles of the existing Rio Hondo-Vincent 220-kV No. 2 T/L (Segment 6).
- Rebuild approximately 15.8 miles of existing Antelope-Mesa 220-kV T/L to 500-kV standards from the southern boundary of the ANF to the existing Mesa Substation (Segment 7).
- Rebuild approximately 33 miles of existing Chino-Mesa 220-kV T/L to 500-kV standards from a point approximately two miles east of the existing Mesa Substation (the "San Gabriel Junction") to the existing Mira Loma Substation. Also rebuild approximately seven miles of the existing Chino-Mira Loma No. 1 line from single-circuit to double-circuit 220-kV structures (Segment 8).
- Build the new Whirlwind Substation, a 500/220-kV substation located approximately four to five miles south of the proposed (no part of Project) Cottonwind Substation near the intersection of 170th Street and Holiday Avenue in Kern County near the TWRA (Segment 9).
- Upgrade the existing Antelope, Vincent, Mesa, Gould, and Mira Loma Substations to accommodate new T/L construction and system compensation elements (Segment 9).
- Install associated telecommunications infrastructure.

Alternative 3: West Lancaster Alternative. This alternative would re-route the new 500-kV T/L in Segment 4, which is currently proposed along 110th Street West, 0.5 miles farther west along 115th Street West. This alternative represents a refinement of the applicant's proposed Project that would place the T/L along an

undeveloped area instead of through development thereby minimizing disturbance to current residences or access to properties located along the paved 110th Street West. As such, land use impacts and visual impacts would be reduced.

Alternative 4: Chino Hills Alternatives. Five route variations in the Chino Hills area have been analyzed, as described below. These routing options have been retained for further analysis, as each would avoid proximity of the T/L to existing residences of the City of Chino Hills; and implementation of one of these routing options would eliminate construction of approximately 16 miles of 500-kV structures along Segment 8A, and eliminate construction in Segment 8C between Chino Substation and Mira Loma Substation. However, upgrades would still occur in Segment 8B (Chino-Mira Loma No. 1 and No. 2) between Chino and Mira Loma Substations through the cities of Chino and Ontario, as described under Alternative 2.

Route A would place a new double-circuit 500-kV T/L in Segment 8A through Chino Hills State Park (CHSP) parallel to and south of an existing double-circuit 220-kV T/L. This alternative route would require construction of a new 500-kV switching station in CHSP, which would allow the new 500-kV T/Ls to connect to existing 500-kV T/Ls located in this area that provide connections to the Mira Loma Substation.

Route B represents a modification to Alternative 4 Route A, in which a new double-circuit 500-kV T/L in Segment 8A would be routed completely through CHSP parallel to and north of an existing double-circuit 220-kV T/L. This alternative route would require construction of a new 500-kV switching station, which would be located east of and outside of the CHSP, and would allow the new double-circuit 500-kV T/L to connect to existing 500-kV T/Ls located in this area that provide connections to the Mira Loma Substation.

Route C represents a modification to Alternative 4 Route A, in which a new double-circuit 500-kV T/L in Segment 8A would be placed parallel to and south of an existing double-circuit 220-kV T/L up to CHSP. At this point, this alternative route would turn east for approximately 2.4 miles, remaining just north of the CHSP boundary, to a new 500-kV switching station. A portion of the existing single-circuit 500-kV T/Ls within CHSP would be re-routed to tie into the new switching station, which would allow the new double-circuit 500-kV T/L to connect to these existing 500-kV T/Ls to allow power flow to continue on to the Mira Loma Substation. In addition, a portion of the existing 220-kV T/L within CHSP would be re-routed outside of CHSP, paralleling the new 500-kV T/Ls from just west of the CHSP boundary to the new switching station. The re-routed 500-kV and 220-kV T/Ls would proceed north out of the new switching station, and would then re-enter CHSP paralleling the re-routed 500-kV T/Ls to reconnect with the existing 220-kV T/L.

Route C Modified is similar to the original Route C option, with the exceptions that (1) the new gas-insulated switching station would be located approximately 2,500 feet northwest of the location described for the original Alternative 4C, (2) transmission line configurations and access roads would be altered to account for relocation of the switching station, and (3) re-routing of the existing single-circuit 500-kV towers in CHSP to the new switching station would occur utilizing double-circuit 500-kV towers.

Route D also represents a refinement to Alternative 4 Route A, in which a new double-circuit 500-kV T/L in Segment 8A would be placed parallel to and north of an existing double-circuit 220-kV T/L up to CHSP. At this point, the alternative route would turn east and proceed to follow the northern boundary of CHSP for approximately 4.2 miles, then just east of Bane Canyon the alignment would turn southeast and cut across CHSP for approximately 1.3 miles to a new 500-kV switching station located immediately east of the boundary of CHSP. This switching station would allow the new double-circuit 500-kV T/L to connect to existing 500-kV T/Ls located in this area to provide connections to the Mira Loma Substation.

Alternative 5: Partial Underground Alternative. This alternative would utilize Gas-Insulated Line (GIL) technology to place the proposed overhead lines underground along Segment 8A through the City of Chino Hills from approximately S8A MP 21.9 to 25.4 to reduce significant visual impacts and address other community concerns.

Alternative 6: Maximum Helicopter Construction in the ANF Alternative. This alternative would utilize helicopter construction within the ANF to the maximum extent feasible. This alternative was requested by the FS to reduce ground disturbance within the ANF by minimizing new road construction through the use of helicopter construction. Helicopter staging/support areas have been identified in the vicinity of Segments 6 and 11 to provide for helicopter construction activities within the ANF. A total of 148 new 500-kV towers would be constructed by helicopter under this alternative: 92 along Segment 6 and 56 along Segment 11.

Alternative 7: 66-kV Subtransmission Alternative. This alternative is comprised of four 66-kV subtransmission line elements, including the following: (1) Undergrounding the existing 66-kV subtransmission line on Segment 7 through the River Commons at the Duck Farm Project (Duck Farm Project) between MP 8.9 and MP 9.9 of Segment 7 as requested by the Board of Supervisors County of Los Angeles to minimize the Project's effects to passive recreation opportunities in the planned Duck Farm Project area; (2) Re-routing and undergrounding the existing 66-kV subtransmission line around the Whittier Narrows Recreation area along Segment 7 (S7 MP 11.4 to 12.025) to provide habitat enhancement for least Bell's vireos as identified by SCE; (3) Re-routing the existing 66-kV subtransmission line through the Whittier Narrows Recreation Area in Segment 7 (S7 MP 12.0 to 13.6) immediately north of the existing 220-kV ROW to reduce the number of structures required (20-foot expanded ROW required); and (4) Re-routing the existing 66-kV subtransmission line around the Whittier Narrows Recreation Area along Segment 8A between the San Gabriel Junction at S8A MP 2.2 and S8A MP 3.8 (2 routing options are provided in this area) to provide habitat enhancement for least Bell's vireos, as identified by SCE.

Summary of Impacts and Mitigation Measures

Direct and Indirect Effects

Table S-1 lists the environmental impacts of the proposed Project and alternatives analyzed in this Specialist Report. The direct and indirect effects of the Project and alternatives are described in full detail in Sections 5 through 11. Alternative 1 (No Project/No Action) impacts are fully described in Section 5; however, because no potential future project information is available an impact significance level for Alternative 1 is not included in the table below.

Significant and Unavoidable Impacts

Significant and unavoidable impacts cannot be reduced to a less-than-significant level with the application of recommended mitigation measures. No impacts that are considered to be significant and unavoidable were identified for the proposed Project or for an alternative to the proposed Project, with regards to Biological Resources.

Cumulative Impacts

Table S-2 lists the cumulative impacts of the proposed Project as described in Section 6.2. This analysis describes the potential for impacts of the proposed Project and alternatives to combine with similar effects of other projects within the geographic scope of the cumulative analysis.

Summary Comparison of Alternatives

Section 12 of this Specialist Report provides a comparison of the proposed Project and alternatives based on the analysis presented in Section 5 through 11. This comparison describes the differences in impacts among the various alternatives, with particular emphasis given to the differences in significant effects.

As shown in Table S-3 and detailed in Section 6, although Alternatives 2 and 6 will result in direct and indirect impacts to biological resources, impacts associated with these alternatives will be lower in size and magnitude than the remaining alternatives. Alternative 2 would result in more land disturbance than Alternative 6 due to the extent of road improvements and construction. Alternative 6 follows the same route as the other alternatives through the ANF, impacting identical habitats and species, but it will comprise a net decrease in the size and magnitude of direct and indirect impacts as a result of the construction of the majority of the transmission line on the ANF by helicopter. This alternative results in the reduction of access road improvements by approximately 42.5 miles. However, short-term impacts associated with helicopter construction, such as noise, rotor wash, and general disturbance to wildlife, would be greater under this alternative as compared to Alternative 2. It is important to note that helicopter-related impacts, while greater under Alternative 6, would be short-term while the loss of habitat and land disturbance associated with the other alternatives would be considered long-term impacts.

Alternative 7 would result in incrementally lower impacts to the federally and State listed least Bell's vireo. The Segment 7 overhead re-route would result in fewer 66-kV subtransmission structures than Alternative 2, and correspondingly less ground disturbance in areas that support least Bell's vireo. The Segment 8A overhead re-route (Option 1) would result in a new route for the 66-kV subtransmission line that would traverse habitat that likely supports least Bell's vireo, but is marginal habitat compared with the habitat crossed by Alternative 2. Segment 8A (Option 2) would occur in the same ROW as Alternative 2 in areas that support the least Bell's vireo, but would result in fewer 66-kV subtransmission structures in the ROW, therefore, decreasing ground disturbance. Both options would incrementally decrease impacts to the least Bell's vireo compared to Alternative 2, but Option 1 would likely result in impacts to fewer birds than Option 2 or Alternative 2. However, it should be noted that impacts to the least Bell's vireo would likely occur under both routing options of Alternative 7 as well as Alternative 2.

Alternative 3 and Alternative 5 will result in only incremental increases in impacts to biological resources as compared to Alternative 2. The re-routed portion of Alternative 3 would incrementally increase impacts to California annual grassland, native wildflower field, and desert wash habitats as compared to Alternative 2, while the implementation of Alternative 5 would result in additional incremental impacts to barren/developed areas and California annual grassland.

Although Alternative 4 (Chino Hills Routes) would construct fewer miles of new transmission line than the other alternatives, it would result in a net increase to disturbance of unique vegetation communities as the re-routes (A through D) traverse primarily natural habitats including CHSP, as opposed to the remaining Project alternatives which traverse primarily barren/developed and agricultural habitats in this area of the Project (Segment 8). In addition, a greater number of streams supporting riparian vegetation would be impacted by

construction of Alternative 4. While there are slight differences in the routing options of Alternative 4, no individual route would result in a substantial increase or decrease of impacts to biological resources.

Table S-1. Summary of Impacts and Mitigation Measures – Biological Resources

Impact	Impact Significance								Mitigation Measures
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	NFS Lands*	
BIOLOGICAL RESOURCES									
B-1: Construction activities would result in temporary and permanent losses of native vegetation.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a: Provide restoration/compensation for impacts to native vegetation communities. B-1b: Implement a Worker Environmental Awareness Program. B-1c: Treat cut tree stumps with Sporax. H-1a: Implement an Erosion Control Plan and demonstrate compliance with water quality permits. AQ-1a: Implement Construction Fugitive Dust Control Plan.
B-2: The Project would result in the loss of desert wash or riparian habitat.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, H-1a, AQ-1a B-2: Implement RCA Treatment Plan.
B-3: The Project would result in the establishment and spread of noxious weeds.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-2 B-3a: Prepare and implement a Weed Control Plan. B-3b: Remove weed seed sources from construction access routes. B-3c: Remove weed seed sources from assembly yards, staging areas, tower pads, pull sites, landing zones, and spur roads.
B-4: Construction activities, including the use of access roads and helicopter construction, would result in disturbance to wildlife and may result in wildlife mortality.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, H-1a, AQ-1a
B-5: Construction activities conducted during the breeding season would result in the loss of nesting birds or raptors.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, AQ-1a B-5: Conduct pre-construction surveys and monitoring for breeding birds.
B-6: The Project would cause the loss of foraging habitat for wildlife.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, AQ-1a, H-1a
B-7: The Project could disturb endangered, threatened, or proposed plant species or their habitat.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a. B-1b, B-3a, H-1a, AQ-1a B-7: Conduct preconstruction surveys for State and federally Threatened, Endangered, Proposed, Petitioned, and Candidate plants and avoid any located occurrences of listed plants.
B-8: The Project could result in the loss of California red-legged frogs and mountain yellow-legged frogs.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, H-1a, AQ-1a B-8a: Conduct protocol surveys for California red-legged frogs and implement avoidance measures. B-8b: Conduct biological monitoring. H-1b: Dry weather construction.
B-9: The Project would result in the loss of arroyo toads.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, B-8b, H-1a, H-1b, AQ-1a B-9: Conduct protocol surveys for arroyo toads and implement avoidance measures in occupied areas.

Table S-1. Summary of Impacts and Mitigation Measures – Biological Resources

Impact	Impact Significance								Mitigation Measures
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	NFS Lands*	
B-10: The Project could result in the loss of desert tortoises.		Class II	Class II	Class II	Class II	Class II	Class II	No	B-1a, B-1b, B-3a, AQ-1a B-10: Conduct presence or absence surveys for desert tortoise, preserve habitat, and implement avoidance measures.
B-11: The Project could result in mortality of desert tortoises as a result of increased predation by common ravens.		Class III	Class III	Class III	Class III	Class III	Class III	No	None recommended.
B-12: The Project could result in the loss of special-status fish.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, B-8b, H-1a, H-1b B-12: Implement avoidance and minimization measures for Santa Ana sucker and other aquatic organisms.
B-13: The Project could result in the loss of Critical Habitat for the Santa Ana sucker.		Class II	Class II	Class II	Class II	No Impact	Class II	Yes	B-1a, B-1b, B-2, B-3a, B-8b, B-12, H-1a, H-1b
B-14: The Project could result in the loss of California condors.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, B-8b B-14: Monitor construction in condor habitat and remove trash and micro-trash from the work area daily.
B-15: The Project would disturb nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, B-5, H-1a, AQ-1a B-15: Conduct protocol or focused surveys for listed riparian birds and avoid occupied habitat.
B-16: The Project would result in the loss of coastal California gnatcatchers.		Class II	Class II	Class II	Class II	Class II	Class II	No	B-1b, AQ-1a B-16: Conduct protocol or focused surveys for coastal California gnatcatcher and implement avoidance measures.
B-17: The Project would result in the loss of critical and/or occupied habitat of the coastal California gnatcatcher.		Class II	Class II	Class II	Class II	Class II	Class II	No	B-1a, B-3a, B-16, AQ-1a B-17: Preserve off-site habitat and/or habitat restoration for the coastal California gnatcatcher.
B-18: The Project could disturb nesting Swainson's hawks.		Class II	Class II	Class II	Class II	Class II	Class II	No	B-1b, AQ-1a B-18a: Conduct pre-construction surveys for Swainson's hawks. B-18b: Removal of nest trees for Swainson's hawks.
B-19: The Project would result in the loss of foraging habitat for Swainson's hawks.		Class II	Class II	Class II	Class II	Class II	Class II	No	B-1a, B-3a, B-18a, AQ-1a B-19: Compensate for loss of foraging habitat for Swainson's hawks.
B-20: The Project could result in electrocution of State and/or federally protected birds.		Class III	Class III	Class III	Class III	Class III	Class III	Yes	None recommended.
B-21: The Project could result in collision with overhead wires by State and/or federally protected birds.		Class III	Class III	Class III	Class III	Class III	Class III	Yes	None recommended.

Table S-1. Summary of Impacts and Mitigation Measures – Biological Resources

Impact	Impact Significance								Mitigation Measures
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	NFS Lands*	
B-22: The Project could result in disturbance to Mohave ground squirrels.		Class II	Class II	Class II	Class II	Class II	Class II	No	B-1a, B-1b, B-3a, AQ-1a B-22a: Conduct protocol surveys for Mohave ground squirrels. B-22b: Implement construction monitoring for Mohave ground squirrels. B-22c: Preserve off-site habitat for the Mohave ground squirrel.
B-23: The Project would result in the loss of candidate, Forest Service Sensitive, or special-status plant species.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, B-7, H-1a, AQ-1a B-23: Preserve off-site habitat/management of existing populations of special-status plants.
B-24: The Project could result in mortality or injury of, and loss of nesting habitat for, southwestern pond turtles.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, B-12, AQ-1a, H-1a, H-1b B-24: Conduct focused presence/absence surveys for southwestern pond turtles and implement monitoring, avoidance, and minimization measures.
B-25: The Project could result in injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, B-12, AQ-1a, H-1a, H-1b B-25: Conduct focused surveys for two-striped garter snakes and south coast garter snakes and implement monitoring, avoidance, and minimization measures.
B-26: The Project could result in injury or mortality of, and loss of habitat for, Coast Range newts.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, AQ-1a, H-1a, H-1b B-26: Conduct focused surveys for coast range newts and implement monitoring, avoidance, and minimization measures.
B-27: The Project could result in injury or mortality of, and loss of habitat for, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, AQ-1a B-27: Monitoring, avoidance, and minimization measures for special-status terrestrial herpetofauna.
B-28: The Project could disturb wintering mountain plovers.		Class III	Class III	Class III	Class III	Class III	Class III	No	None recommended.
B-29: The Project would result in the loss of occupied burrowing owl habitat.		Class II	Class II	Class II	Class II	Class II	Class II	No	B-1a, B-1b, B-3a, AQ-1a B-29: Implement CDFG protocol for burrowing owls.
B-30: The Project would result in the loss of occupied California spotted owl habitat.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-3a, AQ-1a B-30: Conduct pre- and during construction nest surveys for spotted owls.
B-31: The Project could disturb nesting California spotted owls.		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1b, B-30, AQ-1a
B-32: The Project could disturb nesting avian "species of special concern."		Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, B-5, AQ-1a

Table S-1. Summary of Impacts and Mitigation Measures – Biological Resources

Impact	Impact Significance								Mitigation Measures
	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6	Alt. 7	NFS Lands*	
B-33: The Project could result in mortality of, and loss of habitat for, special-status bat species.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, AQ-1a B-33a: Maternity colony or hibernaculum surveys for roosting bats. B-33b: Provision of substitute roosting bat habitat. B-33c: Exclude bats prior to demolition of roosts.
B-34: The Project could result in transmission line strikes by special-status bat species.	Not known	Class III	Class III	Class III	Class III	Class III	Class III	Yes	None recommended.
B-35: The Project could result in mortality of, and loss of habitat for, special-status mammals.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, AQ-1a
B-36: The Project could result in mortality of San Diego desert woodrats.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, AQ-1a B-36: Conduct focused surveys for San Diego desert woodrats and passively relocate.
B-37: The Project could result in mortality of, and loss of habitat for, the ringtail.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, AQ-1a, H-1a B-37: Conduct focused surveys for ringtail and passively relocate during the non-breeding season.
B-38: The Project could result in mortality of American badgers.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-3a, AQ-1a B-38: Conduct focused surveys for American badgers and passively relocate during the non-breeding season.
B-39: The Project could result in the loss of wetland habitats.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b, B-2, B-3a, B-12, AQ-1a, H-1a
B-40: The Project could interfere with established bird and bat migratory corridors.	Not known	Class III	Class III	Class III	Class III	Class III	Class III	Yes	None recommended.
B-41: Corona noise could result in disturbance to wildlife	Not known	Class III	Class III	Class III	Class III	Class III	Class III	Yes	None recommended.
B-42: The Project would result in effects to Management Indicator Species.	Not known	Class II	Class II	Class II	Class II	Class II	Class II	Yes	B-1a, B-1b,B-1c, B-2, B-3a, B-3b, B-3c, B-5, B-8b, B-9, B-30, AQ-1a, H-1a, H-1b

* Indicates that this impact is applicable to National Forest System lands. The significance determination for each impact will be made by the federal lead agency.

Class I – Significant, unavoidable impact

Class II – Less than significant impact with mitigation incorporated

Class III – Less than significant impact

Class IV – Beneficial impact

Table S-2. Cumulative Effects Matrix – Alternative 2: SCE's Proposed Project

Type of Effect	Direct or Indirect Project Effects	Persistent Influence from Past Actions or Natural Events	Present and Reasonably Foreseeable Future Effects	Potential Cumulative Effect	Significance
BIOLOGICAL RESOURCES					
Impacts to Riparian or Natural Communities (Criterion BIO1)	Impact B-1: Construction activities would result in temporary and permanent losses of native vegetation.	Past actions have resulted in considerable loss of native vegetation. Ongoing vegetation management along access roads, towers, and lines results in continued loss of vegetation.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in the loss of native vegetation.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of several native vegetation types that are limited in distribution within Southern California.	Class I
	Impact B-2: The Project would result in the loss of desert wash or riparian habitat.	Past actions have resulted in considerable loss of desert wash and riparian habitat. Ongoing vegetation management along access roads, towers, and lines results in continued loss of vegetation.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in the loss of desert wash and riparian habitat.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact would reduce and/or degrade desert wash and riparian habitat types that are limited in distribution within Southern California.	Class I
	Impact B-3: The Project would result in the establishment and spread of noxious weeds.	Past actions involving temporary and permanent disturbance to natural lands (particularly in the ANF) continues to result in considerable establishment and spread of noxious weeds.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in the establishment and spread of noxious weeds.	The spread of existing weeds or the introduction of new weed populations is a significant Project impact and would also contribute to the cumulative spread of weeds when combined with weed population establishment and spread occurring from other past and reasonably foreseeable projects. The habitat degradation resulting from the spread of weeds is significant and any cumulative effects of the weed invasion would be significant. Other projects that promote new, or worsen existing, weed invasions are likely to occur concurrent with and in the vicinity of the proposed Project.	Class I
	Impact B-4: Construction activities, including the use of access roads and helicopter construction, would result in disturbance to wildlife and may result in wildlife mortality.	While past actions have resulted in wildlife disturbance and mortality, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in disturbance to wildlife and result in wildlife mortality.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, although the cumulative impact would be localized and minimized during project implementation.	Class I

Table S-2. Cumulative Effects Matrix – Alternative 2: SCE's Proposed Project

Type of Effect	Direct or Indirect Project Effects	Persistent Influence from Past Actions or Natural Events	Present and Reasonably Foreseeable Future Effects	Potential Cumulative Effect	Significance
	Impact B-5: Construction activities conducted during the breeding season would result in the loss of nesting birds or raptors.	While past actions have resulted in the loss of nesting birds, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in disturbance to wildlife and result in the loss of nesting birds.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, is significant because the impact substantially reduces the acreage of several habitat types that are important for nesting birds and limited in distribution in Southern California, such as riparian habitats.	Class I
	Impact B-6: The Project would cause the loss of foraging habitat for wildlife.	While past actions have resulted in the loss of foraging habitat for wildlife there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in the loss of foraging habitat for wildlife.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of several habitat types that are important for wildlife and limited in distribution in Southern California.	Class I
Impacts to Endangered or Threatened Species, or Proposed or Critical Habitat (Criterion BIO2)	Impact B-7: The Project could disturb endangered, threatened, or proposed plant species or their habitat.	Past actions involving temporary and permanent disturbance to natural lands continues to result in disturbance to listed plant species.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in disturbance to listed plant species.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of suitable habitat for multiple candidate, FS Sensitive, and special-status plants in the region.	Class I
	Impact B-8: The Project could result in the loss of California red-legged frogs and mountain yellow-legged frogs.	Past actions involving temporary and permanent disturbance to natural lands continues to result in disturbance and loss of California red-legged frogs and mountain yellow-legged frogs.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in disturbance to wildlife and result in disturbance and loss of California red-legged frogs and mountain yellow-legged frogs.	Project impacts, should they occur, would contribute substantially to the incremental take of, and loss of habitat for, these species when combined with the effects of take and loss of habitat caused by other past and reasonably foreseeable projects. These impacts would be cumulatively considerable because the aforementioned past actions and natural events have so severely impacted California red-legged frog and mountain yellow-legged frog populations that both species are now at the brink of extirpation in Southern California.	Class I
	Impact B-9: The Project would result in the loss of arroyo toads.	Past actions involving temporary and permanent disturbance to natural lands continues to result in the loss of arroyo toads.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in the loss of arroyo toads.	Project impacts, should they occur, would contribute substantially to the incremental take of, and loss of habitat for, arroyo toads when combined with the effects of take and loss of habitat caused by other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable.	Class I

Table S-2. Cumulative Effects Matrix – Alternative 2: SCE's Proposed Project					
Type of Effect	Direct or Indirect Project Effects	Persistent Influence from Past Actions or Natural Events	Present and Reasonably Foreseeable Future Effects	Potential Cumulative Effect	Significance
	Impact B-10: The Project could result in the loss of desert tortoises.	Past actions involving temporary and permanent disturbance to natural lands continues to result in the loss of desert tortoise.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in disturbance to wildlife and result in the loss of desert tortoise.	Project impacts, should they occur, would contribute substantially to the incremental take of, and loss of habitat for, desert tortoises when combined with the effects of take and loss of habitat caused by other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable.	Class I
	Impact B-11: The Project could result in mortality of desert tortoises as a result of increased predation by common ravens.	Past actions (e.g., development, urbanization, landfill construction, litter, recreation) continue to result in considerable incremental adverse impacts to desert tortoises resulting from common raven predation. Although natural events such as drought and fire have also adversely impacted desert tortoise populations, no natural event has been linked to population increases of common ravens and their predation of desert tortoises.	Present and foreseeable future actions will result in considerable incremental adverse impacts to desert tortoises resulting from common raven predation.	Raven population increases, if they occur, are expected to be small, and food supplies are not expected to change appreciably in portions of the Project area where desert tortoises may occur. Therefore, the construction of towers in addition to ones already present in the area and substation-associated structures is not expected to result in a significant increase in cumulative predation of the desert tortoise, if present, by common ravens.	Class III
	Impact B-12: The Project could result in the loss of special-status fish.	Past actions continue to result in the loss of special-status fish through ongoing discharges within suitable aquatic habitat.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in the loss of special-status fish.	Project impacts, including increased stream sedimentation through the deposition of erosional silt, would contribute substantially to the incremental loss of special-status fish when combined with the effects of other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable.	Class I
	Impact B-13: The Project could result in the loss of Critical Habitat for the Santa Ana sucker.	Past actions resulting in ongoing discharges could result in continued loss of habitat.	Present and foreseeable future actions including projects within the ANF would be managed to minimize or prevent the loss of critical and/or occupied habitat of the Santa Ana Sucker.	Project impacts would not contribute substantially to the incremental loss of critical habitat when combined with the effects of other past and reasonably foreseeable projects, as these projects would also be managed by the FS to minimize effects to Critical Habitat, and therefore, would not be cumulatively considerable.	Class III

Table S-2. Cumulative Effects Matrix – Alternative 2: SCE's Proposed Project					
Type of Effect	Direct or Indirect Project Effects	Persistent Influence from Past Actions or Natural Events	Present and Reasonably Foreseeable Future Effects	Potential Cumulative Effect	Significance
	Impact B-14: The Project could result in the loss of California condors.	Past actions resulting in accumulations of micro-trash and ongoing hunting activities utilizing lead-based ammunition continue to result in the loss of California condors.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in the loss of California condors.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because construction activities have the potential to impact and result in the loss of California condors.	Class I
	Impact B-15: The Project would disturb nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat.	While past actions have resulted in the disturbance of nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in disturbance to nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, or their habitat.	Project impacts, should they occur, would contribute substantially to the incremental disturbance of nesting southwestern willow flycatchers, least Bell's vireos, yellow-billed cuckoos, and their habitat when combined with the effects of take and loss of habitat caused by other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable.	Class I
	Impact B-16: The Project would result in the loss of coastal California gnatcatchers.	While past actions have resulted in the loss of coastal California gnatcatchers, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in the loss of coastal California gnatcatchers.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of suitable habitat in the region.	Class I
	Impact B-17: The Project would result in the loss of critical and/or occupied habitat of the coastal California gnatcatcher.	While past actions have resulted in the loss of critical and/or occupied habitat of the coastal California gnatcatcher there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in the loss of critical and/or occupied habitat of the coastal California gnatcatcher.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact may considerably reduce the acreage of critical or occupied habitat in the region.	Class I
	Impact B-18: The Project could disturb nesting Swainson's hawks.	While past actions have resulted in the disturbance of nesting Swainson's hawks, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in disturbance to nesting Swainson's hawks.	The incremental effect of the proposed Project, when combined with the effects of other past and reasonably foreseeable projects, would be significant because the combined impact would increase the potential for reproductive failure as it relates to additional construction activities.	Class I
	Impact B-19: The Project would result in the loss of foraging habitat for Swainson's hawks.	While past actions have resulted in the loss of foraging habitat for Swainson's hawks, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in the loss of foraging habitat for Swainson's hawks.	The incremental effect of the proposed Project, when combined with the effects of other past and reasonably foreseeable projects, would be significant because the combined impact could substantially reduce the acreage of suitable foraging habitat in the region.	Class I

Table S-2. Cumulative Effects Matrix – Alternative 2: SCE's Proposed Project					
Type of Effect	Direct or Indirect Project Effects	Persistent Influence from Past Actions or Natural Events	Present and Reasonably Foreseeable Future Effects	Potential Cumulative Effect	Significance
	Impact B-20: The Project could result in electrocution of State and/or federally protected birds.	Past actions involving transmission line construction continues to result in electrocution of State and/or federally protected birds.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in electrocution of State and/or federally protected birds.	Transmission lines of voltages over 69 kV are not known to present an electrocution risk to birds. Therefore, the proposed Project would not have the potential to contribute substantially to cumulative effects.	Class III
	Impact B-21: The Project could result in collision with overhead wires by State and/or federally protected birds.	Past actions involving transmission line construction continues to result in collision with overhead wires by State and/or federally protected birds.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in collision with overhead wires by State and/or federally protected birds.	The cumulative impacts of transmission lines on State and federally protected birds resulting from the Project and other past, present, and reasonably foreseeable projects will be significant.	Class I
	Impact B-22: The Project could result in disturbance to Mohave ground squirrels.	While past actions have resulted in the disturbance to Mohave ground squirrels, there is no persistent influence from these actions.	Present and foreseeable future actions will result in continued loss and fragmentation of suitable habitat in the Antelope Valley will continue to contribute to the decline of this species within the region.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the combined impact substantially reduces the acreage of suitable habitat in the region.	Class I
Have a substantial adverse effect on a candidate, Forest Service Sensitive, or special-status species (Criterion BIO3)	Impact B-23. The Project would result in the loss of candidate, Forest Service Sensitive, or special-status plant species.	Past actions resulting in the establishment and spread of noxious weeds continue to result in the loss of candidate, FS Sensitive, or special-status plant species.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in the loss of candidate, FS Sensitive, or special-status plant species.	The incremental effects of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, are significant because the impact substantially reduces the acreage of suitable habitat for candidate, FS Sensitive, and special-status plants in the region.	Class I
	Impact B-24: The Project could result in mortality or injury of, and loss of nesting habitat for, southwestern pond turtles.	While past actions have resulted in mortality or injury of, and loss of nesting habitat for, southwestern pond turtles, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in mortality or injury of, and loss of nesting habitat for, southwestern pond turtles.	Project impacts, should they occur, would contribute substantially to the incremental mortality, injury, and loss of nesting habitat for southwestern pond turtles when combined with these effects resulting from other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable.	Class I
	Impact B-25: The Project could result in injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes.	While past actions have resulted in the injury or mortality of and loss of habitat for two-striped garter snakes and south coast garter snakes, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in disturbance to wildlife and result in injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes.	Project impacts, should they occur, would contribute substantially to the incremental injury or mortality of, and loss of habitat for, two-striped garter snakes and south coast garter snakes when combined with these effects resulting from other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable.	Class I

Table S-2. Cumulative Effects Matrix – Alternative 2: SCE's Proposed Project

Type of Effect	Direct or Indirect Project Effects	Persistent Influence from Past Actions or Natural Events	Present and Reasonably Foreseeable Future Effects	Potential Cumulative Effect	Significance
	Impact B-26: The Project could result in injury or mortality of, and loss of habitat for, Coast Range newts.	While past actions have resulted in injury or mortality of, and loss of habitat for, Coast Range newts, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in injury or mortality of, and loss of habitat for, Coast Range newts.	Primarily as a result of considerable past effects, Project impacts, should they occur, would contribute substantially to the incremental injury or mortality of, and loss of habitat for, Coast Range newts when combined with these effects resulting from other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable.	Class I
	Impact B-27: The Project could result in injury or mortality of, and loss of habitat for, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species.	While past actions have resulted in injury or mortality of, and loss of habitat for, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in injury or mortality of, and loss of habitat for, terrestrial California Species of Special Concern and Forest Service Sensitive amphibian and reptile species.	Project impacts, should they occur, would contribute substantially to the incremental injury or mortality of, and loss of habitat for, the special-status terrestrial herpetofauna when combined with these effects resulting from other past and reasonably foreseeable projects, and therefore, would be cumulatively considerable.	Class I
	Impact B-28: The Project could disturb wintering mountain plovers.	While past actions have resulted in the disturbance of wintering mountain plovers, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in disturbance to wintering mountain plovers.	The incremental effect of the proposed Project, when combined with the effects of other past and reasonably foreseeable projects, would be significant, because the combined impact substantially reduces the total amount of suitable wintering habitat in the region.	Class I
	Impact B-29: The Project would result in the loss of occupied burrowing owl habitat.	While past actions have resulted in the loss of occupied burrowing owl habitat, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in the loss of occupied burrowing owl habitat.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because construction activities would result in loss of suitable and possibly occupied burrowing owl habitat in the Northern and Southern regions of the Project.	Class I
	Impact B-30: The Project would result in the loss of occupied California spotted owl habitat.	While past actions have resulted in the loss of occupied California spotted owl habitat, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in the loss of occupied California spotted owl habitat.	The incremental effect of the Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because construction activities would result in loss of suitable and possibly occupied California spotted owl habitat in the Central Region of the Project.	Class I

Table S-2. Cumulative Effects Matrix – Alternative 2: SCE's Proposed Project					
Type of Effect	Direct or Indirect Project Effects	Persistent Influence from Past Actions or Natural Events	Present and Reasonably Foreseeable Future Effects	Potential Cumulative Effect	Significance
	Impact B-31: The Project could disturb nesting California spotted owls.	While past actions have resulted in disturbance to nesting California spotted owls, there is no persistent influence from these actions.	Present and foreseeable future actions including projects within the ANF, would be managed to minimize or prevent disturbance to nesting California spotted owls.	The incremental effect of the Project, when combined with the effects created by other past and reasonably foreseeable projects, would not be significant, because mitigation would minimize disturbance of nesting California spotted owls in the Central Region of the Project.	Class III
	Impact B-32: The Project could disturb nesting avian "species of special concern."	While past actions have resulted in disturbance to nesting avian "species of special concern," there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in disturbance to nesting avian "species of special concern."	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because construction activities would take place within or adjacent to habitats that are important for nesting avian species of special concern in southern California.	Class I
	Impact B-33: The Project could result in mortality of, and loss of habitat for, special-status bat species.	While past actions have resulted in mortality of and loss of habitat for special-status bat species, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in mortality of, and loss of habitat for, special-status bat species.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of suitable roosting habitat in the region.	Class I
	Impact B-34: The Project could result in transmission line strikes by special-status bat species.	While expected at very low numbers, past actions involving transmission line construction continues to result in strikes by special-status bat species.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in transmission line strikes by special-status bat species.	The frequency of transmission line strikes by special-status bats is expected to be quite low despite these cumulative effects, due to the ability of these bat species to detect and avoid transmission lines during echolocation. Therefore, the cumulative impacts of transmission line strikes on special-status bat species resulting from the Project and other past, present, and reasonably foreseeable projects will be less than significant.	Class III
	Impact B-35: The Project could result in mortality of, and loss of habitat for, special-status mammals.	While past actions have resulted in mortality of and loss of habitat for special-status mammals, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in mortality of, and loss of habitat for, special-status mammals.	Impacts to the Los Angeles pocket mouse, Tehachapi pocket mouse, San Joaquin pocket mouse, Northwestern San Diego pocket mouse, Southern grasshopper mouse, Tulare grasshopper mouse, and San Diego black-tailed jackrabbit are cumulatively considerable. The proposed Project will not eliminate suitable habitat for Los Angeles pocket mouse, Tulare grasshopper mouse, and Tehachapi pocket mouse.	Class I

Table S-2. Cumulative Effects Matrix – Alternative 2: SCE's Proposed Project

Type of Effect	Direct or Indirect Project Effects	Persistent Influence from Past Actions or Natural Events	Present and Reasonably Foreseeable Future Effects	Potential Cumulative Effect	Significance
	Impact B-36: The Project could result in mortality of San Diego desert woodrats.	While past actions have resulted in mortality of San Diego desert woodrat, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in mortality of San Diego desert woodrat.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of suitable habitat in the region.	Class I
	Impact B-37: The Project could result in mortality of, and loss of habitat for, the ringtail.	While past actions have resulted in mortality of and loss of habitat for the ringtail, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in mortality of, and loss of habitat for, the ringtail.	The amount of suitable ringtail habitat that will be cumulatively impacted by other past and reasonably foreseeable projects and the proposed Project relative to the home range requirement of a ringtail and the availability of habitat is small. However, Project impacts would combine with impacts of other projects, and the cumulative impact is significant for ringtails.	Class I
	Impact B-38: The Project could result in mortality of American badgers.	While past actions have resulted in mortality of and loss of habitat for American badgers, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in disturbance to wildlife and result in mortality of American badgers.	The incremental effect of the proposed Project, when combined with the effects created by other past and reasonably foreseeable projects, would be significant, because the impact substantially reduces the acreage of suitable habitat in the region.	Class I
Have a substantial adverse effect on federally protected wetlands (Criterion BIO4)	Impact B-39: The Project could result in the loss of wetland habitats.	While past actions have resulted in the loss of wetland habitats there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could result in the loss of wetland habitats.	Project impacts, should they occur, would also contribute to the cumulative loss of these habitat types when combined with the effects of the loss of these habitat types caused by other past and reasonably foreseeable projects, and therefore would be significant.	Class I
Interfere substantially with native fish or wildlife movements, corridors, or nursery sites (Criterion BIO5)	Impact B-40: The Project could interfere with established bird and bat migratory corridors.	Past actions (e.g., development, urbanization, recreation) continue to result in considerable incremental adverse impacts resulting from interference with established bird and bat migratory corridors.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could interfere with established bird and bat migratory corridors.	The Project is not located along major landbird migration routes and is not expected to have a significant cumulative effect on migratory patterns or migration routes for birds. The Antelope (2/3) Transmission Project in combination with the proposed Project could potentially occur along a significant migratory route in the Antelope Valley for migratory bats, including western red bat and hoary bat. However, despite these cumulative effects, these migratory corridors would not be lost owing to the ability of these bat species to detect and avoid transmission lines during echolocation. Therefore, the cumulative impacts of transmission lines on bird and bat migratory corridors resulting from the Project and other past, present, and reasonably	Class III

Table S-2. Cumulative Effects Matrix – Alternative 2: SCE's Proposed Project					
Type of Effect	Direct or Indirect Project Effects	Persistent Influence from Past Actions or Natural Events	Present and Reasonably Foreseeable Future Effects	Potential Cumulative Effect	Significance
				foreseeable projects will be less than significant.	
	Impact B-41: Corona noise could result in disturbance to wildlife.	Existing transmission line creates corona noise. Other transmission lines in the region also create corona noise.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could create noise.	Corona noise is already present along most of the proposed Project, and while the proposed Project will result in louder corona noise for most segments, wildlife can be expected to have already been exposed and likely habituated to this disturbance. As such, corona noise from the proposed Project is not expected to combine with noise from other projects in a cumulatively significant manner.	Class III
	Impact B-42: The Project would result in effects to Management Indicator Species.	While past actions have resulted in mortality of and loss of habitat for MIS, there is no persistent influence from these actions.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, could affect MIS.	Project impacts, should they occur, would also contribute to the cumulative loss of habitats for MIS when combined with the effects of the loss of these habitats caused by other past and reasonably foreseeable projects, and therefore would be significant.	Class I
Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinances (Criterion BIO6)	N/A	Past actions may continue to conflict with local policies or ordinances protecting biological resources.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, may conflict with local policies or ordinances protecting biological resources.	Because of the extensive planning involved in project design, including implementation of APMs BIO 1 through BIO-7, and the mitigation measures described in Criteria BIO1 through BIO5, the proposed Project is consistent with the local and regional policies and ordinances protecting biological resources.	N/A

Table S-2. Cumulative Effects Matrix – Alternative 2: SCE's Proposed Project					
Type of Effect	Direct or Indirect Project Effects	Persistent Influence from Past Actions or Natural Events	Present and Reasonably Foreseeable Future Effects	Potential Cumulative Effect	Significance
Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP (Criterion BIO7)	N/A	Past actions may continue to conflict with provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP.	Present and foreseeable future actions including numerous infrastructure and residential development projects, as well as projects within the ANF, may conflict with provisions of an adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP.	Through Project design and implementation of APMs BIO-1 through BIO-7 and the mitigation measures described in Criteria BIO1 through BIO5, SCE shall ensure consistency with the conservation goals of the WMPHCP.	N/A

Table S-3. Summary Comparison of Environmental Issues/Impacts – Biological Resources

Environmental Issues / Impacts	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3	Alternative 4[1]	Alternative 5	Alternative 6	Alternative 7
Loss or degradation of vegetation communities	Potential projects would likely traverse the same geographic regions as either the proposed Project or Alternatives 3 through 7, and subsequently introduce similar types of impacts	1,612 acres of vegetation communities will be degraded, of which 349 acres will be permanent.	1,612* acres of vegetation communities will be degraded, of which 349* acres will be permanent.	Route A: 1,651 acres of vegetation communities will be degraded, of which 366 acres will be permanent. Route B: 1,678 acres of vegetation communities will be degraded, of which 356 acres will be permanent Route C: 1,729 acres of vegetation communities will be degraded, of which 365 acres will be permanent Route C Modified: 1,708 acres of vegetation communities will be degraded, of which 386 acres will be permanent Route D: 1,688 acres of vegetation communities will be degraded, of which 365 acres will be permanent	1,637 acres of vegetation communities will be degraded, of which 353 acres will be permanent.	1,526 acres of vegetation communities will be degraded, of which 303 acres will be permanent.	1,612** acres of vegetation communities will be degraded, of which 349** acres will be permanent.
Loss or degradation of riparian communities	Same as above.	Approx. 11.2 acres of riparian communities will be degraded or impacted. In addition, approximately one additional acre of riparian habitat would be impacted by the reconstruction of the crossing of access road 3N27 and Big Tujunga Creek on the ANF.	Unknown acreage of riparian communities will be degraded or impacted as final engineering has not been conducted. Will be similar to Alt. 2.	Unknown acreage of riparian communities will be degraded or impacted as final engineering has not been conducted. Will be greater than Alt. 2.	Same as Alternative 2.	Approx. 11.1 acres of riparian communities will be degraded or impacted.	Unknown acreage of riparian communities will be degraded or impacted as final engineering has not been conducted. Potentially less than Alt. 2.
Number of Riparian Conservation Areas (RCAs) subject to Project disturbance (NFS lands only)	Same as above.	Vehicle access, road grading, and culvert placement would affect 171 RCAs, of which 95 would be negatively impacted.	Same as Alternative 2	Same as Alternative 2	Same as Alternative 2	Vehicle access, road grading, and culvert placement would affect 86 RCAs, of which 57 would be negatively impacted.	Same as Alternative 2
Potential to spread noxious weeds	Same as above.	Construction would result in potential spread of noxious weeds. 224.5 miles of access and spur roads would be constructed and improved and approximately 1,612 acres of ground disturbing activities would result as part of construction.	Same as Alternative 2	Greater land disturbance would occur in open space and riparian habitat, increasing the likelihood for spread of noxious weeds. Route A: 230.6 miles of constructed and improved roads and 1,651 acres of ground disturbing activities Route B: 227.3 miles of constructed and improved roads and 1,678 acres of ground disturbing activities Route C: 231.1 miles of constructed and improved roads and 1,729 acres of ground disturbing activities Route C Modified: 216.7 miles of constructed and improved roads and 1,708 acres of ground disturbing activities Route D: 232.0 miles of constructed and improved roads and 1,688 acres of ground disturbing activities	Greater land disturbance would occur in open space, increasing the likelihood for spread of noxious weeds. 224.5 miles of access and spur roads would be constructed and improved and approximately 1,637 acres of ground disturbing activities would result as part of construction.	Reduced number of spur roads and potential decrease in road traffic may reduce the likelihood for spread of noxious weeds. 181.9 miles of access and spur roads would be constructed and improved and approximately 1,526 acres of ground disturbing activities would result as part of construction.	Potentially less land disturbance would occur in open space and riparian habitat, decreasing the likelihood for spread of noxious weeds. Approx. 224.5 miles of access and spur roads would be constructed and improved and approximately 1,612 acres of ground disturbing activities would result as part of construction.

Table S-3. Summary Comparison of Environmental Issues/ Impacts – Biological Resources

Environmental Issues / Impacts	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3	Alternative 4[1]	Alternative 5	Alternative 6	Alternative 7
Disturbance to common wildlife, nesting birds and raptors	Same as above.	Construction would result in disturbance to wildlife and nesting birds. Noise would occur from approx. 361,703 onroad vehicle trips as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Approximately 224.5 miles of new and upgraded road and 1,612 acres of ground disturbing activities would result in habitat disturbance. 172.5 miles of new transmission line would be added.	Noise would occur from 361,586 onroad vehicle trips as part of construction. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Approximately 224.5 miles of new and upgraded road and 1,612 acres of ground disturbing activities would result in habitat disturbance. 172.9 miles of new transmission line would be added.	Greater loss of habitat would increase disturbance to wildlife and nesting birds. Noise would occur from approx. 343,866 (Route A), 358,186 (Route B), 374,013 (Route C), 400,772 (Route C Mod.), or 365,722 (Route D) onroad vehicle trips as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Route A: 230.6 miles of new and upgraded roads and 1,651 acres of ground disturbing activities. 156.8 miles of new transmission line would be added Route B: 227.3 miles of new and upgraded roads and 1,678 acres of ground disturbing activities. 160.4 miles of new transmission line would be added. Route C: 231.1 miles of new and upgraded roads and 1,729 acres of ground disturbing activities. 159.0 miles of new transmission line would be added. Route C Modified: 216.7 miles of new and upgraded roads and 1,708 acres of ground disturbing activities. 158.2 miles of new transmission line would be added. Route D: 232.0 miles of new and upgraded roads and 1,688 acres of ground disturbing activities. 160.5 miles of new transmission line would be added.	Greater land disturbance would increase disturbance to wildlife and nesting birds. Noise would occur from approx. 418,912 onroad vehicle trips as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Approximately 224.5 miles of new and upgraded road and 1,637 acres of ground disturbing activities would result in habitat disturbance. 172.5 miles of new transmission line would be added.	A reduction in land disturbance would occur; however, helicopter use would increase disturbance to wildlife and nesting birds due to noise, rotor wash, etc. Noise would also occur from approx. 361,697 onroad vehicle trips as part of construction of this Project. Up to approximately 43,909 helicopter trips would occur as part of construction on the ANF. Approximately 181.9 miles of new and upgraded road and 1,526 acres of ground disturbing activities would result in habitat disturbance. 172.5 miles of new transmission line would be added.	Potentially less land disturbance in natural areas would decrease disturbance to wildlife and nesting birds. Noise would occur from approx. 362,861 onroad vehicle trips as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Approximately 224.5 miles of new and upgraded road and 1,612 acres of ground disturbing activities would result in habitat disturbance. 172.5 miles of new transmission line would be added.
Disturbance to threatened/ endangered and special-status plants	Same as above.	Although not observed, construction may affect listed plant species if present. Potential impacts to special-status plant species observed and potentially occurring in the Project area. 1,612 acres of land would be disturbed (349acres permanent).	Same as Alternative 2	Greater land disturbance would increase potential impacts to listed plants. Route A: 1,651 acres of land would be disturbed (366 acres permanent). Route B: 1,678 acres of land would be disturbed (356 acres permanent). Route C: 1,729 acres of land would be disturbed (365 acres permanent). Route C Modified: 1,708 acres of land would be disturbed (386 acres permanent). Route D: 1,688 acres of land would be disturbed (365 acres permanent).	Greater land disturbance would increase potential impacts to listed plants. 1,637 acres of land would be disturbed (353 acres permanent).	Reduced potential to affect listed plant species due to decreased land disturbance. 1,526 acres of land would be disturbed (303 acres permanent).	Potentially less land disturbance in natural areas would decrease potential impacts to listed plants (Segment 8A Option 1 slightly increases potential effects to listed plants, if present). 1,612 acres of land would be disturbed (349acres permanent).

Table S-3. Summary Comparison of Environmental Issues/Impacts – Biological Resources

Environmental Issues / Impacts	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3	Alternative 4[1]	Alternative 5	Alternative 6	Alternative 7
Disturbance to threatened/ endangered and special-status wildlife	Same as above.	Potential effects to listed species including arroyo toad, California condor, California Gnatcatcher, least Bell's vireo, and Santa Ana Sucker. Noise would occur from approx. 361,703 onroad vehicle trips as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Approximately 224.5 miles of new and upgraded road and 1,612 acres of ground disturbing activities would result in habitat disturbance. 172.5 miles of new transmission line would be added.	Same as Alternative 2 Noise would occur from approx. 361,586 onroad vehicle trips as part of construction. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Approximately 224.5 miles of new and upgraded road and 1,612 acres of ground disturbing activities would result in habitat disturbance. 172.9 miles of new transmission line would be added.	Greater land disturbance, including effects to riparian habitat and coastal sage scrub in the Chino Hills, would increase potential impacts to listed species such as least Bell's vireo and California gnatcatcher. Noise would occur from approx. 343,866 (Route A), 358,186 (Route B), 374,013 (Route C), 400,772 (Route C Mod.), or 365,722 (Route D) onroad vehicle trips as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Route A: 230.6 miles of new and upgraded roads and 1,651 acres of ground disturbing activities. 156.8 miles of new transmission line would be added. Route B: 227.3 miles of new and upgraded roads and 1,678 acres of ground disturbing activities. 160.4 miles of new transmission line would be added. Route C: 231.1 miles of new and upgraded roads and 1,729 acres of ground disturbing activities. 159.0 miles of new transmission line would be added. Route C Modified: 216.7 miles of new and upgraded roads and 1,708 acres of ground disturbing activities. 158.2 miles of new transmission line would be added. Route D: 232.0 miles of new and upgraded roads and 1,688 acres of ground disturbing activities. 160.5 miles of new transmission line would be added.	Same as Alternative 2 Noise would occur from approx. 418,912 onroad vehicle trips as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Approximately 224.5 miles of new and upgraded road and 1,637 acres of ground disturbing activities would result in habitat disturbance. 172.5 miles of new transmission line would be added.	Decreased land disturbance would decrease effects to listed wildlife such as arroyo toad, and would eliminate direct effects to Santa Ana sucker; however, use of access roads and helicopter staging areas may still affect some listed species. Use of helicopters may affect California condor, if present. Noise would occur from 361,697 onroad vehicle trips as part of construction of this Project. Up to approximately 43,909 helicopter trips would occur as part of construction on the ANF. Approximately 181.9 miles of new and upgraded road and 1,526 acres of ground disturbing activities would result in habitat disturbance. 172.5 miles of new transmission line would be added.	Potentially less land disturbance, including effects to riparian habitat and coastal sage scrub in the vicinity of the Whittier Narrows, would slightly decrease impacts to listed species such as least Bell's vireo. Noise would occur from approx. 362,861 onroad vehicle trips as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Approximately 224.5 miles of new and upgraded road and 1,612 acres of ground disturbing activities would result in habitat disturbance. 172.5 miles of new transmission line would be added.
Transmission line strikes and electrocutions	Potential for transmission line strikes and electrocutions of birds.	Potential for transmission line strikes and electrocutions of birds. 172.5 miles of new transmission line would be added.	Slightly longer transmission line route would result in slightly higher potential for line strikes and electrocutions. 172.9 miles of new transmission line would be added.	Greater length of transmission line in open space would result in slightly higher potential for line strikes and electrocutions. 156.8 (Route A), 160.4 (Route B), 159.0 (Route C), 158.2 (Route 4C Modified), 160.5 (Route D) miles of new transmission line would be added.	Underground portion of transmission line in Chino Hills would result in lower potential for line strikes and electrocutions. 172.5 miles of new transmission line would be added.	Same as Alternative 2	Greater length of 66-kV line in open space would result in slightly higher potential for line strikes and electrocution; however, underground portions would reduce potential for line strikes and electrocution. 172.5 miles of new transmission line would be added.

Table S-3. Summary Comparison of Environmental Issues/Impacts – Biological Resources

Environmental Issues / Impacts	Alternative 1 (No Project/Action)	Alternative 2 (SCE's Proposed Project)	Alternative 3	Alternative 4[1]	Alternative 5	Alternative 6	Alternative 7
Interference with wildlife movement	Potential projects would likely traverse the same geographic regions as either the proposed Project or Alternatives 3 through 7, and subsequently introduce similar types of impacts	Noise would occur from approx. 361,703 onroad vehicle trips as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Approximately 224.5 miles of new and upgraded road and 1,612 acres of ground disturbing activities would result in habitat disturbance. Activities are expected to occur during daylight hours; however, traffic in and out of the site may also occur after dark. Vehicular impacts to wildlife would occur.	Noise would occur from approx. 361,586 onroad vehicle trips as part of construction. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Approximately 224.5 miles of new and upgraded road and 1,612 acres of ground disturbing activities would result in habitat disturbance. Activities are expected to occur during daylight hours; however, traffic in and out of the site may also occur after dark. Vehicular impacts to wildlife would occur.	Noise would occur from approx. 343,866 (Route A), 358,186 (Route B), 374,013 (Route C), 400,772 (Route C Mod.), or 365,722 (Route D) onroad vehicle trips as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Route A: 230.6 miles of new and upgraded roads and 1,651 acres of ground disturbing activities. 156.8 miles of new transmission line would be added. Route B: 227.3 miles of new and upgraded roads and 1,678 acres of ground disturbing activities. 160.4 miles of new transmission line would be added. Route C: 231.1 miles of new and upgraded roads and 1,729 acres of ground disturbing activities. 159.0 miles of new transmission line would be added. Route C Modified: 216.7 miles of new and upgraded roads and 1,708 acres of ground disturbing activities. 158.2 miles of new transmission line would be added. Route D: 232.0 miles of new and upgraded roads and 1,688 acres of ground disturbing activities. 160.5 miles of new transmission line would be added. Activities are expected to occur during daylight hours; however, traffic in and out of the site may also occur after dark. Vehicular impacts to wildlife would occur.	Noise would occur from approx. 418,912 onroad vehicle trips as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Approximately 224.5 miles of new and upgraded road and 1,637 acres of ground disturbing activities would result in habitat disturbance. Activities are expected to occur during daylight hours; however, traffic in and out of the site may also occur after dark. Vehicular impacts to wildlife would occur. .	Noise would occur from 361,697 onroad vehicle trips as part of construction of this Project. Up to approximately 43,909 helicopter trips would occur as part of construction on the ANFApproximately 181.9 miles of new and upgraded road and 1,526 acres of ground disturbing activities would result in habitat disturbance. Activities are expected to occur during daylight hours; however, traffic in and out of the site may also occur after dark. Vehicular impacts to wildlife would occur.	Noise would occur from approx. 362,861 onroad vehicle trips as part of construction of this Project. Up to approximately 9,339 helicopter trips would occur as part of construction on the ANF. Approximately 224.5 miles of new and upgraded road and 1,612 acres of ground disturbing activities would result. Activities are expected to occur during daylight hours; however, traffic in and out of the site may also occur after dark. Vehicular impacts to wildlife would occur.

* Land disturbance under Alternative 3 would decrease by a factor of one structure within Segment 4. As such, the acres disturbed would continue to be almost identical to Alternative 2.
** Alternative 7 would have some additional temporary disturbance associated with underground construction of the 66-kV subtransmission lines in Segment 7 through the Duck Farm Project area and due to the overhead re-routing the 66-kV line around the Whittier Narrows Recreation area in Segments 7 and 8A. New access and spur roads may also be required for the new approximately 1,200 foot ROW for the San Gabriel River crossing within Segment 8A associated with the Whittier Narrows Overhead Re-Route.