BIOLOGICAL ASSESSMENT

for the

Sunrise Powerlink Project

October 2008

Prepared for:

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Federal Action Agencies:

United States Bureau of Land Management
El Centro

United States Forest Service
Cleveland National Forest

United States Army Corps of Engineers
Los Angeles District

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1.0 PROJECT DESCRIPTION

1.1 Introduction

This section describes the Final Environmentally Superior Southern Route (ESSR) of the Sunrise Powerlink Project ("Project") as identified in the Final Environmental Impact Report/Environmental Impact Statement (FEIR/FEIS) prepared by the California Public Utilities Commission (CPUC) and the Bureau of Land Management (BLM) in October 2008. Section 1.2 presents an overview of the Project. Section 1.3 details the Project Design Features and describes the construction activities and procedures associated with the Project. Section 1.4 explains the operation and maintenance (O&M) procedures. Section 1.5 presents a comprehensive listing of San Diego Gas and Electric Company's (SDG&E) conservation measures to reduce potential adverse effects resulting from the Project.

This section includes maps of the Project area that illustrate land-ownership and general routing. The attached Map Book (Appendix A) includes detailed maps that illustrate the approximate proposed locations of each transmission structure and associated facilities based upon the status of SDG&E's preliminary engineering studies to date.

1.2 Overview of the Final Environmentally Superior Southern Route

SDG&E proposes to construct a new electric transmission line between the existing Imperial Valley and Sycamore Canyon Substations, a proposed new Modified Route D Substation ("MRD Substation"), and other system modifications in order to reliably operate the new line. The entire Project would traverse approximately 120 miles between the El Centro area of Imperial County and southwestern San Diego County, in southern California. For clarity, the Project is described in three separate segments or "links" according to geographical location: Desert South Link, CNF South Link, and Inland Valley South Link. In addition, three system upgrades (reconductors from Sycamore Canyon Substation to Pomerado, Scripps and Elliott substations) will be required. The entire route and upgrades are shown on Figure 1. In order to provide a frame of reference, the proposed ESSR right-of-way (ROW) has been assigned mileposts (MP), which range from the Imperial Valley Substation (MP 0) to the Sycamore Canyon Substation (MP 118).

1.2.1 Desert South Link

Figure 2 highlights the 30-mile Desert South Link. This Link would parallel the existing Southwest Power Link (SWPL) ROW beginning at the Imperial Valley Substation, located just west of the intersection of Mandrapa Road and Lyons Road in Imperial

County, four miles southwest of El Centro and ending at the Imperial County-San Diego County border (MP 30), just a few miles north of the Mexican border.

From the Imperial Valley substation the line would head northwest for approximately 11 miles through BLM land with a very small number of private parcels interspersed, crossing Interstate 8 and County Highway S80 (Evan Hewes Highway) where it would turn west one mile west of Plaster City (MP 11). The route would follow the SWPL west on BLM land for approximately 3.5 miles, then west-southwest for approximately 5 miles. It would turn southwest for approximately 10 miles, passing through more BLM and private land, crossing County Route S2 and the Eastern San Diego and Arizona Railroad (MP 22.5) all the while paralleling the existing SWPL.

The Desert South Link is located in the Colorado Desert bioregion consisting primarily of desert scrub habitats, including Sonoran desert scrub, Sonoran creosote bush scrub, stabilized and partially stabilized desert sand dunes, desert dry wash woodland, desert pavement, badlands, Sonoran wash scrub, Sonoran mixed woody scrub, Sonoran mixed woody and succulent scrub, acacia scrub, semi-desert chaparral, and Peninsular juniper woodland and scrub.

1.2.1.1 Mountain Springs Grade

Just past the railroad crossing, the transmission line would enter an area known as Mountain Springs Grade (MP 22.5) where Interstate 8 north and south lanes split to create an area known as the I-8 Island. This route crosses BLM and State Lands and is adjacent to the congressionally delegated Jacumba Federal Wilderness Area. This area is best characterized as rugged and remote terrain. Much of this area will require construction by helicopter.

1.2.2 CNF South Link

Figure 3 highlights the CNF South Link. The CNF South Link begins at the Imperial County-San Diego County boundary (MP 30) and terminates about five miles east of the village of Alpine near MP 92. In this link the proposed transmission ROW alignment is 200 feet wide and contains a single circuit 500 kV transmission line that continues to follow the SWPL ROW for approximately five miles and then swerves sharply north/northwest away from the SWPL ROW for approximately 13 miles crossing BLM lands and a few interspersed private parcels. At MP 53 the line enters the Cleveland National Forest (CNF) turning south-southwest and continues to traverse United States Forest Service (USFS) land in the mountainous area of southeastern San Diego County for approximately 13 miles just north of the existing SDG&E Cameron Substation. This part of the route is dominated by chaparral communities.

From MP 66 to MP 78 the proposed ROW roughly runs in a westerly direction through private land and south of the Hauser Federal Wilderness Area to follow an existing 69 kV

line ROW. The route would pass immediately east of the existing SDG&E Barrett Substation and would then head in a northerly direction following an existing 69 kV line ROW west of Big Potrero Truck Trail. From MP 78 to MP 91, the line continues to traverse CNF and private lands heading in a general north-east direction until it reaches the location for a proposed new substation identified in the Sunrise Powerlink Project Recirculated Draft Environmental Impact Report / Supplemental Draft Environmental Impact Statement (RDEIR/SDEIS) as the MRD Substation. Again this portion of the proposed ROW is dominated by chaparral communities.

1.2.2.1 Modified Route D Substation

This substation would be located on private land west of Japatul Valley Road and the substation fence line would enclose approximately 40 acres. Access to the substation is from the existing unimproved private road called Bell Bluff Truck Trail. The access road length is approximately 3 miles from Japatul Valley Road to the MRD Substation. The proposed 500kV transmission line will terminate at the substation. Two 230kV transmission lines will exit the substation overhead on a common double circuit structure heading northwest to Sycamore Canyon Substation.

1.2.3 Inland Valley South Link

Figure 4 highlights the Inland Valley South Link. Within the Inland Valley South Link, the proposed double circuit 230 kV line would be contained within a 300-foot-wide easement except at underground portions where the ROW would be 60-feet wide or in Franchise. The transmission line traverses BLM, CNF, and private lands in a northwesterly direction for approximately 27 miles from the MRD Substation to the Sycamore Canyon Substation (MP 91 to MP118). After going underground from MP 93.9 to MP 100 (*see* description below), the transmission line continues westerly and northerly for about 14 miles re-entering the CNF and crossing an existing 69 kV transmission line. Continuing from there, the route would head north-west traversing private lands and west within an existing SDG&E ROW along the Marine Corps Air Station (MCAS) Miramar boundary to the existing Sycamore Canyon Substation. The line transitions from the 300-foot easement to an existing 100-foot-wide easement from Highway 67 to Sycamore Canyon Substation.

1.2.3.1 Star Valley Road Option

From MP 93.9 the overhead portion of the route would transition to underground and traverse along Star Valley Road to Alpine Boulevard. The route would then continue west underground within the Alpine Boulevard ROW. It would remain underground and cross under Interstate 8 at Peutz Valley until MP 100 where the route would transition overhead.

An alternative to the Star Valley Road option identified in the RDEIR/SEIS, proposes to traverse the 230 kV overhead circuits north from the proposed new MRD Substation and transition underground at Alpine Boulevard. It would then continue west within the Alpine Boulevard ROW and follow the same alignment as above. If installation of the 230kv line underground in the eastern end of Alpine Boulevard is found to be feasible, the entire Star Valley option would no longer be included in the Project.

1.2.4 System Upgrades

Figure 5 shows several system upgrades required to allow for the full utilization of the proposed new transmission line. These upgrades occur in fairly urbanized areas of coastal San Diego along existing ROW. They comprise expansion and reconductoring of existing utility infrastructure.

1.2.4.1 Sycamore Canyon Substation

The existing Sycamore Canyon Substation will require installation of a third 230/69 kV transformer. The expansion of the Sycamore Canyon Substation would occur within the existing fence line of the substation.

1.2.4.2 Encina Substation

The existing Encina Substation will require installation of a new 230/138 kV transformer within the existing substation boundaries.

1.2.4.3 Sycamore-Scripps 69kV Line

The Sycamore-Scripps 69 kV line will also require upgrading. Portions of the reconductor would occur on MCAS Miramar. The reconductoring would be installed on the existing overhead transmission structures and would entail the replacement of the conductor and would not require the replacement of any overhead transmission structures with the exception of the overhead to underground transition structures. The work would also require re-grading sections of the existing access roads, and pulling pads/staging areas to facilitate the repair and reconductor work. Upgrades of associated substation breakers and disconnects would occur within SDG&E's Scripps and Sycamore Canyon substations. In addition, the upgrade of three existing underground portions of the Sycamore-Scripps 69 kV circuit from single to bundled cable would be included. A short segment (930 feet) of new underground trench construction would be required in Rue Biarritz to re-locate the line into city streets.

1.2.4.4 Sycamore-Pomerado 69kV Line

The Sycamore-Pomerado 69 kV line will also require upgrading. The approximately 2-mile upgrade of two 69kV circuits involves the replacement of the conductors and not the replacement of any overhead transmission structures. Existing access roads will be used to construct the upgrade. The work would also require re-grading sections of the existing access roads, clearing some vegetation around poles, pulling pads/staging areas to facilitate the repair and reconductor work, and creating temporary trails to poles that lack existing foot and/or vehicular access.

Upgrades of associated substation breakers and disconnects would occur within SDG&E's Pomerado and Sycamore Canyon substations.

1.2.4.5 Sycamore-Elliott 69kV Line

SDG&E is proposing to reconductor the 69 kV line from the Elliot Substation in the Community of Tierrasanta to the Sycamore Canyon Substation northeast of MCAS Miramar near the City of Poway. The segment of the transmission line proposed for reconductoring runs from northeast Tierrasanta, through west Mission Trails Regional Park (MTRP), over State Highway 52 and through east MCAS Miramar Camp Elliot before ending at Sycamore Canyon Substation south of Beeler Canyon Road. The project entails replacing approximately 8 miles of overhead conductor and 11 wood poles, and changing insulators and/or pole tops on 24 wood poles within SDG&E's existing ROW. The work would also require re-grading sections of the existing access roads, clearing some vegetation around poles, pulling pads/staging areas to facilitate the repair and reconductor work, and creating temporary trails to poles that lack existing foot and/or vehicular access.

1.3 Project Design Features

The evaluation of impacts to federally listed threatened and endangered species within the approximate 120 mile ROW takes into account a number of permanent and temporary design features necessary to construct, support, and maintain the proposed transmission lines. The ROW, as well as the design features, are illustrated in the attached Map Book (Appendix A) and are briefly summarized below.

1.3.1 Staging Areas

Construction of the transmission lines would begin with the establishment of staging areas, which would be required for storing materials, construction equipment, and vehicles. In all areas, vegetation will be cleared. In some areas, the staging area may

need to be scraped by a bulldozer and a temporary layer of rock laid to provide an all weather surface. Unless otherwise directed by the land-owner, the rock would be removed from the staging area upon completion of construction and the area would be restored as required by the CPUC and BLM. All staging areas would be fenced for security. For the purposes of this report, staging areas were assumed to have temporary impacts to native vegetation because each would be restored and re-vegetated with native vegetation. There would be a number of staging areas over the length of the alignment. Each staging area is shown on a map sheet in Appendix A.

1.3.2 Access and Spur Roads

Construction of the new 500 kV and 230 kV transmission structures would require access for construction crews, materials and equipment. Similarly, construction of other project components such as laydown areas and fly yards will require vehicle access. The substation will require all-weather (paved) vehicle access. New access roads or access spur roads would be constructed using a bulldozer or grader, followed by a roller to compact and smooth the ground. Front-end loaders would be used to move the soil locally or offsite. Typically for transmission access roads, laydown areas and fly yards, 14-foot-wide straight sections of road and 16- to 20-foot-wide sections at curves would be required to facilitate safe movement of equipment and vehicles. Typically for the substation access road, 32-foot-wide sections of road would be required to facilitate safe movement of equipment and vehicles. Wherever possible, new access roads or spur roads would be constructed within the transmission line ROW, or existing streets and access roads would be used. Existing access roads may be improved for project use, as required. See detailed maps in Appendix A for locations of existing and proposed access roads.

After project construction, existing and new permanent access roads would be used by maintenance crews and vehicles for inspection and maintenance activities. Temporary construction roads not required for future maintenance access would be removed and restored after project construction in the area is complete.

1.3.3 Pads (i.e., Structure Sites)

Seven drawings are provided in Appendix C to illustrate various configurations of the pad areas for both 500kv and 230kv tower structures throughout the proposed Project. 500 kV structures in BLM and private areas will have a temporary 200-foot by 400-foot workspace (all within the proposed 200-foot ROW) cleared and graded for construction. These temporary work area impacts would be minimized to the maximum extent possible and other minimization measures would be used (conservation measures below in Section 1.5). These 200-foot by 400-foot areas will be recontoured at the extremities after construction to blend in to original grade. At each structure location, an area approximately 100 feet by 100 feet would be cleared and graded within the above-

described 200-feet by 400-feet area using a bulldozer or backhoe. Additionally, a 35-foot by 75-foot flat graded pad will be cleared and graded immediately adjacent to the 100-foot by 100-foot area. Additional equipment may be required if solid rock is encountered at a structure location. Rock-hauling, hammering, or blasting may be required to remove the rock.

500 kV dead end and angle structures in CNF areas will have a 200-foot by 400-foot (all within the proposed 200-foot ROW) area cleared and graded for construction and future line maintenance (See Appendix C). Grading for the construction and maintenance pads may not be required at all structure locations. Bulldozers or backhoes will be used for grading. Additional equipment may be required if solid rock is encountered at a structure location. Rock-hauling, hammering, or blasting may be required to remove the rock. This area would be minimized to the maximum amount possible and other minimization measures would be used (conservation measures below in Section 1.5).

500 kV tangent structures in CNF areas and 230 kV structures west of the MRD Substation will have an area approximately 100 feet by 100 feet cleared and graded for construction and future line maintenance (See Appendix C). Grading for construction and maintenance pads may not be required at all structure locations. Additionally, a 35-foot by 75-foot flat graded pad will be cleared and graded immediately adjacent to the 100-foot by 100-foot area. Bulldozers or backhoes will be used for grading. Additional equipment may be required if solid rock is encountered at a structure location. Rock-hauling, hammering, or blasting may be required to remove the rock.

Segments of the Project will require helicopter construction. These segments will not include the above mentioned 200-foot by 400-foot work areas, but will include the 100-foot by 100-foot pad and the 35-foot by 75-foot pad (See Appendix C). In addition, these segments will require two 20-foot by 20-foot helicopter pads or two 20-foot by 20-foot elevated helicopter platforms per structure with a footpath to the structure. The helicopter pads may be cleared and graded for construction and future line maintenance. The elevated helicopter platforms may be wood or steel platforms.

The overhead portion of the Project would require the construction of transmission support structures. Each support structure would require the installation of foundations, which are typically drilled concrete piers. First, holes would be excavated for each structure: four holes for each lattice structure and one for each single shaft tubular steel pole and transition structure. The holes would be drilled using a truck mounted excavator equipped with augers of various sizes depending on the diameter and depth requirements of the hole to be drilled. Each foundation would extend approximately 2 feet above the ground level.

Where solid rock is encountered, blasting, rock-hauling, or the use of a rock anchoring or mini pile system may be required. The rock anchoring or mini-pile system would be used in areas where site access is limited or adjacent structures could be damaged as a result of blasting or rock-hauling activities. In environmentally sensitive areas, a HydroVac,

which uses water pressure and a vacuum, would be used to excavate material into a storage tank. In areas where it is not possible to operate large drilling equipment due to access or environmental constraints, hand digging may be required. Reinforcing steel anchor bolt cages and concrete would be installed after excavation and prior to structure installation.

As mentioned above, it is anticipated that a 100-foot by 100-foot area would be cleared of vegetation for construction and be available for future line maintenance. These areas are demarked as "Construction and Maintenance Pad" in the associated Map Book (Appendix A); however, they should be considered as a moveable "bubble" only illustrating the existence of a construction pad. For initial impact calculations the total number of structures will be multiplied by 10,000 square feet. Their individual size may vary somewhat from structure to structure but the average area for all of the areas will not exceed 10,000 square feet times the number of structures.

On a permanent basis, the additional 35-foot by 75-foot flat graded pad will be maintained fully devoid of vegetation immediately adjacent to the 100-foot by 100-foot area for use by SDG&E maintenance vehicles. This pad will essentially be a widened part of the access road so that other vehicles can safely pass without interference if the maintenance pad is occupied. It is assumed for the purposes of this report that these pads will result in permanent impacts.

1.3.4 Tower Structures

Lattice towers and steel support structures would be assembled on site, except where helicopter delivery is performed. Steel members for each structure would be delivered to the site by flatbed truck, except where helicopter delivery is performed. Assembly would be facilitated onsite by a small truck-mounted crane. Subsequent to assembly, the structures would be lifted onto the foundation using a large crane designed for erecting towers. The crane would move along the ROW access roads and spur roads as towers are erected.

1.3.5 Stringing Conductors, Shield Wire, and Fiber Optic Ground Wire

Conductor, shield wire, and fiber optic ground wire would be placed on the transmission line support structures by a process called stringing. The first step to conductor and fiber optic shield wire stringing would be to install insulators and stringing sheaves. Stringing sheaves are rollers that are temporarily attached to the lower portion of the insulators at each transmission line support structure to allow conductors to be pulled along the line. Additionally, temporary clearance structures would be erected where required prior to stringing any transmission lines. The temporary clearance structures are typically vertical wood poles with cross arms and are erected at road crossings or crossings with other energized electric and communication lines to prevent contact during stringing activities.

Bucket trucks may also be used to provide temporary clearance. Bucket trucks are trucks fitted with a hinged arm ending in an enclosed platform called a "bucket," which can be raised to let the worker in the "bucket" service aerial equipment.

Once the stringing sheaves and temporary clearance structures are in place, the initial stringing operation would commence. This would consist of pulling a sock line through the sheaves along the same path the Project transmission line would follow. The sock line is attached to the hard line, which follows the sock line as it is pulled through the sheaves. The hard line would then be attached to the conductor or fiber optic shield wire to pull it through the sheaves into its final location. Pulling the lines may be accomplished by attaching it to a specialized vehicle. Pulling the sock line is accomplished with a small helicopter that moves along the ROW.

Following the initial stringing operation, pulling and tensioning the line would be required to achieve the correct sagging of the transmission lines between support structures. Finally, the tension and sag of conductors and wires would be fine-tuned, stringing sheaves would be removed and the conductors would be permanently attached to the insulators at the support structures.

1.3.6 Pull Sites

Following the initial stringing operation, pulling and tensioning the line would be required to achieve the correct sagging of the transmission lines between support structures. Pulling and tensioning sites would be required every one to four miles along the ROW and would encompass approximately one to two acres each to accommodate required equipment. Equipment at sites required for pulling and tensioning activities would include tractors and trailers with spooled reels that hold the conductors and trucks with the tensioning equipment. To a practicable extent, pulling and tensioning sites would be located within the ROW.

Depending on topography, minor grading may be required at some sites to create level pads for equipment. Vegetation will likely be cleared throughout the pull site area but after use, the whole area would be restored and re-vegetated resulting in only temporary impacts to native vegetation except for two permanent pulling sites proposed for the crossing of I-8. Both temporary and permanent pulling sites are shown in the Map Book (Appendix A).

1.3.7 Underground Transmission Lines and Trenching

Underground construction is proposed in the area in and around Alpine (*see* Section 1.2.3.1 above). The 230 kV lines will require a trench approximately 3 to 7 feet wide and 6 feet deep. Two trenches, separated by 20 feet, would be excavated for the double-circuit 230 kV underground segments within the Inland Valley South Link.

Trenching to install the underground duct banks would commence after SDG&E identifies all underground utilities along the proposed underground alignments. Actions to accomplish this would include notifying all applicable utilities via underground service alert to locate and mark existing utilities and conducting exploratory excavations (potholing) as necessary to verify the location of existing utilities. SDG&E would secure encroachment permits for trenching in public streets, if required.

The majority of the underground duct banks (described below) would be installed in a vertical configuration using open-cut trenching techniques. Each circuit contains three phases and each phase is comprised of two cables for a total of 6 cables. Each cable is installed in a duct. A vertical duct bank configuration would place the six cables of the circuit in two columns of three ducts stacked on top of each other.

Trenching would be staged so that open trench lengths would not exceed that required to install the duct banks. A maximum of 700 to 1000 feet would be open for each work location. Work construction may have more than one crew working a spread at a time. Where needed, open trench sections that are not under active construction would have steel plates placed over them in order to maintain vehicular and pedestrian traffic. Provisions for emergency vehicle access would be arranged with local jurisdictions in advance of construction activities. Should groundwater be encountered, it would be pumped into a tank for disposal in accordance with project permits.

Excavated materials not temporarily stored to use for backfill would be hauled off-site to a materials storage yard. Based on the anticipated rate of construction progress (300 to 500 feet open at one time), approximately 400 cubic yards of excavated material would be off-hauled per day. Excavated materials would be tested for their suitability as a thermal backfill material in the trench.

1.3.8 Duct Bank Installation

As the trench for the underground transmission line is completed, SDG&E would begin to install the cable conduit, reinforcement bar, ground wire, and concrete conduit encasement, which collectively comprise the duct bank. The duct bank for the 230 kV underground transmission lines would be larger and would measure approximately 3.5 feet by 3.5 feet.

The 69 kV underground transmission line segments would be constructed with one cable per phase, which would require three conduits. However, six conduits would be placed in the trench, which would leave three spare conduits for any potential future circuit pursuant to SDG&E's current standards for 69 kV underground construction. The 230 kV lines would require two cables per phase (bundled). Therefore, six conduits would be installed in a trench for a single 230 kV circuit. Two trenches would be required for the double-circuit 230 kV line, with one circuit per trench. Additionally, ducts for

communication cables, which are required for system protection and communication purposes, would be installed in the same duct bank as the transmission cables.

After the duct bank has been installed in the trench, the next step would be to cover the duct bank with an engineered thermal backfill and compact the backfill as appropriate. Each duct bank would require a minimum cover of 36 inches. Finally, a road base or slurry concrete cap would be installed within the trench, and the disturbed surface would be restored in compliance with the locally issued permits. As sections of the trench are covered and restored, additional sections would then be opened for duct bank installation. Often several trenches will be opened concurrently, conduit installed concurrently, and trenches backfilled concurrently. This process would continue until all PVC conduits have been installed in the duct bank. Note that at this point the PVC conduit does not contain the transmission line cable; see below (Cable Pulling, Splicing and Termination) for a description of how the underground transmission line would be installed.

1.3.9 Vault Installation

SDG&E would excavate and install pre-formed concrete splice vaults during trenching for the duct banks. Initially, the vaults would be used to pull cable through the conduits and splice the cables together during construction. During operation, the vaults would provide access to the underground cables for maintenance, inspections, and repairs.

Vaults would be constructed of prefabricated steel-reinforced concrete and designed to withstand the maximum credible earthquake in the area and heavy truck traffic loading. Vaults would occur approximately every 800 to 2000 feet along underground segments. Installation of each vault would take place over a one-week period. First, the vault pit would be excavated and shored, followed by delivery and installation of the vault. Next, the excavated area would be filled with backfill and compacted. Finally, the excavated area would be restored, as required.

1.3.10 Substations

The Project involves construction of one new substation, a new access road and modifications to several existing substations. The proposed 500 kV transmission line would connect the existing Imperial Valley Substation to the proposed MRD Substation and continue west from the substation as a double circuit 230 kV lines to the existing Sycamore Canyon Substation. It is assumed that construction of the new substation and access road will result in permanent impacts to native vegetation located within the proposed footprint.

The Imperial Valley and Sycamore Canyon substations are existing substations that would require modifications to physically accommodate the new transmission line. Modifications will also be constructed at Elliot, Scripps and Pomerado Substations to

support the additional 69 kV transmission line reconductors, as well as at Encina and Sycamore Canyon substations to accommodate additional transformers. Modifications to existing substations are all within previously disturbed areas of existing substations footprints and will not result in any impacts to native vegetation.

1.3.11 Transition Structure Construction

At each end of an underground segment, the cables would rise out of the ground at transition structures, which accommodate the transition to overhead lines. Transition structures constructed as part of the project would consist of a tubular steel pole structure with an anchor-bolted pier foundation for each circuit. The transition structure would support cable terminations, lightning arresters, and dead-end hardware for overhead conductors. Compared to the 69 kV transition structures, the hardware would be larger for the 230 kV structures. Construction methods for these structures would be substantially similar to those described for overhead transmission line structures.

1.3.12 Special Construction Methods (Horizontal Boring and Directional Drilling)

In concert with the tasks outlined above, special construction methods (horizontal boring and/or directional drilling) may be required in areas where open trench construction is not feasible. These areas would include railroad and trolley tracks, large utility crossings, roads, drainage crossings, and other environmentally sensitive areas. SDG&E would secure the necessary permits to conduct these specialized construction activities, such as a special use permit, encroachment permit, helicopter lift plan, explosives permit, etc.

1.3.12.1 Horizontal Boring

Horizontal boring (jack-and-bore) simultaneously pushes a steel casing through the crossing and removes the spoil inside the casing with a rotating auger. First, boring pits would be excavated at the sending (entrance) and receiving (exit) ends of the bore. The bore equipment is inserted into the bore pit at the sending end, where a 36- to 42-inch steel casing is pushed through the earth, under the crossing. Depending on soil conditions, water is often used to lubricate the auger during boring operations. Casings would be welded together incrementally and installed at least three to four feet below the crossing, or as required by local permits. Once the bore is complete, the steel casings would be replaced with installation of either a concrete or fiber reinforced mortar pipe in which, the duct banks would be installed using plastic spacers to secure them in place. The pipe would remain to protect the conduit once it has been installed. The duct banks and associated cables would consist of the same respective materials and installed by employing a similar method as those installed on the remainder of the underground portions of the transmission line.

1.3.12.2 Directional Drilling

Directional drilling uses a jet bit that can be steered to cut through the earth, creating a small pilot hole. A drill rig and control booth would be set up on one side of the directional drill to facilitate drilling operations. A small containment pit would be excavated around the drill stem to contain any drilling fluids used during the drilling process. Once the jet bit has reached the opposite side of the crossing, a reamer along with the casing would be attached to the auger and pulled back through the pilot hole to widen it. Multiple reamers of increasing diameters would be used to incrementally increase the size of the hole to the diameter necessary to install the conduit casings.

1.3.13 Blasting

As described above transmission line structure foundations would normally be installed using drilled shafts or piers. If hard rock is encountered within the planned drilling depth, blasting may be required to loosen or fracture the rock in order to reach the required depth to install the structure foundation. The Desert South Link has several areas of hard rock within the Mountain Springs Grade portion. The CNF South Link and Inland Valley South Link are characterized by significantly more hard rock conditions, and blasting will be required in those links.

Prior to blasting, a detailed blasting plan will be submitted by the construction contractor to SDG&E for each blast site that includes blasting methods, survey of existing structures and facilities, and scaled distance calculations that estimate the projection distance and speed of particles from blasting activities. Blasting would be very brief in duration (milliseconds), and the noise would dissipate with distance. Blasting produces less noise and vibration than comparable non-blasting methods to remove hard rock. Non-blasting methods include track rig drills, rock breakers, jack hammers, rotary percussion drills, core barrels, and rotary rock drills with rock bits, which would require a much longer time duration to excavate approximately the same amount of rock as blasting.

1.3.14 Helicopter Construction

Helicopters would be used to support construction activities in areas where access is limited (e.g., no suitable access road, limited pad area to facilitate onsite structure assembly area) or there are environmental constraints to accessing the project area with standard construction vehicles and equipment. Project activities potentially facilitated by helicopters may include delivery of construction laborers, equipment and materials to structure sites, structure placement (except tubular steel poles), hardware installation, and wire stringing operations. It is anticipated that helicopters would be used for project activities in portions of the Desert South, CNF South, and Inland Valley South links.

Specific towers requiring helicopter construction have been preliminarily identified as follows:

• MP 77.9 – MP 83.5: Structures SP034 to SP074 (41 towers)

• MP 92.6 – MP 97.6: Structures C94 to C104 (11 towers)

• MP 100.2 – MP 103.5: Structures C48 to C66 (19 towers)

• MP 123.4 – MP 136.3: Structures I35 to I74 (40 towers)

All helicopter construction activities would be based at a fly yard, which is a project-material staging area. The fly yards would be approximately 10 to 30 acres and would be sited at locations to permit a maximum fly time of 4 to 8 minutes to reach structure locations. Temporary vegetation compaction will used to prepare the fly yards instead of grading or blading. Regarding the ground disturbance, composite mats will be laid on the ground, interlocked, and provide a solid but non-invasive ground platform to support the fly yard operations. These mats will also reduce or eliminate the need for water for dust control resulting from the helicopter operations. The anticipated locations of the proposed helicopter fly yards are shown in Appendix A. Primarily, fly yards would be used for material storage and erection of structure sections prior to transport to the final structure locations for installation. Additionally, fueling trucks, maintenance trucks and operations crews would be based in the fly yards.

Prior to installation, each tower structure would be assembled in three to six sections at the fly yard. Each section would weigh approximately 12,000 to 15,000 pounds, depending on the lifting capacity of the helicopter. Helicopters would be unable to lift and install typical 230 kV or 500 kV tubular steel poles, due to their excessive weight unless specifically designed for helicopter installation.

In areas requiring helicopter-aided construction, laborers, materials, and equipment would be flown in by helicopter. Foundation excavation would be completed using hand digging and/or portable equipment prior to delivery of structure sections. After assembly at the fly yard, the tower sections would be attached by cables from the helicopter crane to the top four corners of the structure section and airlifted to the structure location. Upon arrival at the structure location, the section would be placed directly on to the foundation or atop the previous structure section.

The fly yard locations provided are considered approximate and subject to change, additions or deletions upon acquisition of an installation contractor prior to the beginning of construction. Upon completion of field review, a final determination will be made on the necessity of certain fly yards and the respective locations that provide the most efficient, economic, safest and least impact use of the fly yards that are needed.

Appropriate dust control measures will be implemented at these fly yard locations as well as the locations along the route on which they are utilized. As an example, dust control palliatives may be applied on fly yards and structure sites as needed to control down wash of the helicopter rotor dependent on the weight of the lifts, air temperature, humidity, soil type, and property owner requirements. SDG&E is proposing to use two types of palliatives that have been identified by the California Department of Transportation (Caltrans) as requiring no water quality testing and therefore have nominal impacts to water quality when properly applied. The two types proposed for use are psyllium and guar/plant gum based. While it is difficult to determine the exact area around each structure that would encounter ground disturbance due to a rotor's down wash, past experience has shown dust control measures may be needed as far as 500 feet from a central working area in certain situations. Fly yards will be re-vegetated following completion of construction resulting in only temporary impacts to native vegetation.

1.3.15 Labor and Equipment

The Project would be constructed primarily by contract personnel with SDG&E responsible for project administration and inspection. However, SDG&E also may use its own crews for certain portions of the work, as the schedule may require. It is anticipated that multiple contractors would be working concurrently on the separate links of ESSR in order to meet the projected in-service date of summer 2012. Construction would commence as early as the third quarter 2009 or earlier and conclude before summer 2012. The maximum estimated number of individuals required for construction labor would not exceed 800, with the majority of that labor required to install structure foundations. The majority of construction personnel will be on-site between October 2009 and December 2012. The maximum number of construction workers is expected to be approximately 800 during periods of peak construction activity. The maximum 800 individuals would be needed each month between October 2009 and December 2011 when the majority of foundation construction is anticipated. Workers will use staging areas and/or fly yards for parking.

1.3.16 Site Cleanup

At the conclusion of construction, where affected by project construction, SDG&E would:

- Restore all removed curbs, gutters, and sidewalks
- Repave all removed or damaged paved surfaces
- Restore removed or damaged landscaping or vegetation
- Remove all construction materials from project site and associated staging areas and disposed of at an off-site location, as appropriate.

1.4 Operation and Maintenance

Following project construction, operation and maintenance of the new line would commence. Operation and maintenance activities would include all operation and maintenance requirements set forth by California Independent System Operator (CAISO) and CPUC General Orders including activities such as patrol of the lines, climbing inspections, tower and wire maintenance, routine line washing, and repairs of access and spur roads, permanent pulling sites and permanent helicopter platforms. SDG&E would keep necessary work areas around all structures clear of vegetation and would limit the height of vegetation along the ROW. The following section provides details on the anticipated operation and maintenance requirements for the proposed transmission line.

1.4.1 Routine System Inspection, Maintenance and Repair

Regular inspection of transmission lines, substations, and support systems is critical for safe, efficient, and economic operation. Early identification of items needing maintenance, repair, or replacement would ensure continued safe operation of the Project. The following sections describe SDG&E's proposed plan for inspecting and maintaining the Project.

1.4.2 Transmission Line Maintenance

1.4.2.1 Inspection Patrols

Regular ground and aerial inspections would be performed in accordance with the CAISO requirements per the Transmission Control Agreement between CAISO and SDG&E concerning transmission facility maintenance. SDG&E's overhead transmission lines and substations would be inspected for corrosion, equipment misalignment, loose fittings, and other mechanical problems. The need for vegetation management would also be determined during inspection patrols. As required by CAISO, aerial inspection (visual and infrared) of the entire system and climbing inspections of transmission structures would be conducted annually. Aerial inspection would be conducted by helicopter and would require two or three crewmembers, including the pilot. Ground inspections, including underground system components within each vault, would be conducted by up to three crewmembers every three years.

1.4.2.2 Hardware Maintenance and Repairs

Electrical equipment housed on poles or support structures may include conductors, insulators, switches, transformers, lightning arrest devices, line junctions, and other electrical equipment. This equipment may require addition, replacement or repair over

time. Typically, equipment repair or replacement would be conducted by a four-person crew with two or three trucks, a boom or line truck, an aerial truck and an assist truck.

1.4.2.3 Insulator Washing

Arcing can occur when an electrical discharge is created from the combination of atmospheric condensation and dust on porcelain insulators. Arcing may cause electrical outages, but can be prevented by routinely washing the insulators to keep them free of dust. Insulator washing involves driving a water truck to within six feet of a tower base and using a high-pressure hose to spray deionized water at the insulators. Two crewmembers and a water truck are required for insulator washing. Typically, insulator washing takes approximately 30 minutes per transmission structure. Insulator washing is not expected more than twice a year and would require 300 gallons of water per structure and 3,000 gallons of water per day.

1.4.2.4 Right-of-Way Repair

ROW repairs would include grading or repair of existing maintenance access roads and work areas, permanent pulling sites and helicopter platforms and spot repair of sites subject to flooding or scouring. Activities related to ROW repair are usually conducted after the rainy season, when water has caused erosion damage. Required equipment may include a motor grader, backhoe, four-wheel drive pickup truck, and a cat-loader. The cat-loader has steel tracks whereas the grader, backhoe, and truck would typically have rubber tires. All access roads are maintained on a 2-year schedule.

1.4.2.5 Vegetation Management

SDG&E would maintain a minimum clearance of 10 feet around the base or foundation of all electrical transmission structures. In addition, SDG&E maintains work areas adjacent to access roads and electric transmission structures for vehicle and equipment access necessary for operations, maintenance and repair. Shrubs and other obstructions would be regularly removed near structures to facilitate inspection and maintenance of equipment and to ensure system reliability. In addition, vegetation with a mature height of 15 feet or taller would not be allowed to grow within 10 horizontal feet of any overhead conductor or working area in order to protect system reliability and public safety.

Vegetation would be removed using mechanical equipment such as chain saws, weed trimmers, rakes, shovels, mowers and brush hooks. The duration of activities and the size of crew and equipment required would be dependent on the amount and size of the vegetation to be trimmed or removed. Most vegetation removal or tree trimming activities can be completed in one day.

Local application of herbicide would occur within a ten-foot radius of each structure. Aerial application of herbicide would not be allowed under USFWS recommendations.

1.4.3 Substation Maintenance

Substation maintenance activities would include scheduled equipment repairs, cleaning, and testing to prevent service interruptions. It is anticipated that routine maintenance activities would require approximately six trips per year to each substation by a two to four person crew. General substation monitoring and control functions are performed remotely from SDG&E's central operations facility located at 9060 Friars Road, San Diego. Regular operation of the substation would require one or two workers in a light utility truck to visit the substation on a weekly basis. Once per year, a major maintenance inspection would be conducted that would require 20 personnel for approximately one week.

To prevent unauthorized entry, warning signs would be posted and fencing and locked gates would be present at all substations. In addition, a remotely monitored security system may be installed at the proposed MRD Substation.

1.4.4 Emergency Response

Emergencies are any event requiring immediate response to a condition by SDG&E personnel. These may include, but are not limited to, car-to-pole contacts, downed poles, fires, transformer outages and/or outages due to down wire as a result of extreme weather. Responding crews would vary in number and equipment needs depending on the size and severity of the emergency. Typically, a four-person crew with a line truck, aerial lift truck, and an assist truck would respond to the emergency to make repairs. Crews may be required to respond to an emergency in a remote area without roads. In areas without vehicle access, helicopters may be used to respond quickly to emergencies.

1.4.5 Fire Protection and Security

SDG&E employs a full time Fire Coordinator and Pole Protection Crews who work closely with local fire protection jurisdictions, including the California Department of Forestry and Fire Protection (CDF) to ensure implementation and effectiveness of safety requirements and procedural protocols. Additional requirements and protocols are contained in SDG&E's Fire Plan Standard Practice, which is currently under SDG&E's review and has not yet been approved as of September 2008. This document is intended to serve as an educational tool to prevent work-related fires and the associated protocols and policies related to fire prevention.

SDG&E implements the following practices to prevent fire during construction and maintenance/repair activities: brush clearing prior to work, stationing a water truck at the job site to keep the ground and vegetation moist in extreme fire conditions, enforcing red flag warnings, and providing "fire behavior" training to all pertinent personnel. SDG&E does not directly fight fires. However, SDG&E personnel will extinguish any remaining pole fires once a fire has passed through the work area.

1.5 Conservation Measures

SDG&E will implement the following Avoidance and Minimization Measures (AMM) and mitigation measures to avoid, minimize, or mitigate the potential adverse effects to individuals, populations, or habitat of listed and proposed species. The avoidance, minimization, and mitigation measures developed to address potential effects from the Project on listed species are a subset of the measures described in the FEIR/FEIS for the Project that are required by the CPUC and BLM. Only the measures relevant to the species addressed in this consultation are included in the Biological Assessment.

1.5.1 Perform Protocol Surveys

Prior to construction activities, SDG&E would conduct on-the-ground surveys (following USFWS protocols where they exist) for the following listed species where such surveys had not been conducted in 2007 and 2008, or for those species for which surveys in 2007 and 2008 were not reliable due to lack of sufficient rainfall.

- San Diego Thornmint (*Acanthomintha ilicifolia*)
- San Bernardino Bluegrass (*Poa atropurpurea*)
- Quino Checkerspot Butterfly (*Euphydryas editha quino*)
- Laguna Mountains Skipper (*Pyrgus ruralis lagunae*)
- Arroyo Toad (*Bufo californicus*)
- Southwestern Willow Flycatcher (*Empidonax traillii extimus*)
- Coastal California Gnatcatcher (*Polioptila californica californica*)
- Least Bell's Vireo (*Vireo bellii pusillus*)
- Stephen's Kangaroo Rat (*Dipodomys stephensi*)
- Desert Bighorn Sheep (*Ovis canadensis nelsoni*)

1.5.2 Train Project Personnel

Prior to construction, all of SDG&E's contractors, subcontractors and project personnel would receive training regarding the appropriate work practices necessary to effectively implement the AMMs and to comply with the applicable environmental laws and regulations including appropriate wildlife avoidance, and impact minimization

procedures, the importance of these resources and the purpose and necessity of protecting them.

1.5.3 Restrict the Construction of Access and Spur Roads

Except when not feasible due to physical or safety constraints, all project vehicle movement would be restricted to existing access roads and access roads constructed as a part of the project and determined and marked by SDG&E in advance for the contractor, contractor-acquired accesses, or public roads. New access road construction for the project would occur year-round. However, when feasible, every effort would be made to avoid constructing roads during the nesting season. In addition to regular watering to control fugitive dust created during clearing, grading, earth-moving, excavation, and other construction activities which could interfere with plant photosynthesis, a 15 mile per hour speed limit will be observed on dirt access roads to reduce dust and allow reptiles and small mammals to disperse.

SDG&E shall coordinate with the authorized officer for the applicable federal, State, or local land owner/administrator at least 60 days before construction in order to determine if gates shall be installed on access roads, especially trails that would be dually used as access roads, to prevent unauthorized vehicular access to the ROW. Gate installation shall be required at the discretion of the land management agency. On trails proposed for dual use as access roads, gates shall be wide enough to allow horses, bicycles, and pedestrians to pass through. SDG&E shall document its coordination efforts with the administering agency of the road/trail and provide this documentation to the CPUC, BLM, and all affected jurisdictions 30 days prior to construction. Signs prohibiting unauthorized use of the access roads shall be posted on these the installed gates. To control unauthorized use of project access roads by off-road vehicle enthusiasts, SDG&E shall provide funding to land management entities responsible for areas set aside for habitat conservation to provide for off-road vehicle enforcement patrols. The responsible land management entities will formulate what funding is reasonable to control unauthorized use of project access roads.

All new access roads or spur roads constructed as part of the project that are not required as permanent access for future project maintenance and operation would be permanently closed. Where required, roads would be permanently closed using the most effective feasible and least environmentally damaging methods appropriate to that area with the concurrence of the underlying landowner and the governmental agency having jurisdiction (e.g., stockpiling and replacing topsoil or rock replacement). This would limit new or improved accessibility into the area. Mowing of vegetation can be an effective method for protecting the vegetative understory while at the same time creating access to the work area. Mowing should be used when permanent access is not required since, with time, total re-vegetation is expected. If mowing is in response to a permanent access need, but the alternative of grading is undesirable because of downstream siltation potential, it should be recognized that periodic mowing would be necessary to maintain

permanent access. The project biological construction monitor will conduct checks on mowing procedures to ensure that mowing for temporary or permanent access roads is limited to a 14-foot-wide area on straight portions of the road and a 16- to 20-foot-wide area at turns, and that the mowing height is no less than 4 inches from finished grade.

1.5.4 Restrict Construction and Survey Activities Based on Final Design Engineering Drawings

The area limits of project construction and survey activities would be predetermined based on the temporary and permanent disturbance areas noted on the final design engineering drawings, with activity restricted to and confined within those limits. Survey personnel will keep survey vehicles on existing roads. During project surveying activities, brush clearing for footpaths, line-of-sight cutting, and land surveying panel point placement in sensitive habitat would require prior approval from the project biological resource monitor in conformance with the AMMs. Hiking off roads or paths for survey data collection is allowed year-round as long as other AMMs are met. Stringing of new wire and reconductoring for the project would be allowed year round in sensitive habitats if the conductor is not allowed to drag on the ground or in brush and all vehicles used during stringing remain on project access roads. Where stringing requires that conductor drop within brush or drag on or through the brush or ground or vehicles leave project access roads, SDG&E would perform a site survey, or more as appropriate, to determine presence or absence of nesting migratory birds (including the three listed bird species subject to this consultation) or other listed species in the work area. SDG&E would submit results of this survey to the USFWS and to the California Department of Fish and Game (CDFG) prior to dropping wire in brush, dragging wire on the ground or through brush, or taking vehicles off project access roads. No paint or permanent discoloring agents would be applied to rocks or vegetation to indicate limits of survey or construction activity where any sensitive biological resources or wildlife habitats are encountered in the field.

1.5.5 Build Access Roads at Right Angles to Streambeds and Washes

To the extent feasible, access roads would be built at right angles to the streambeds and washes. Where it is not feasible for access roads to cross at right angles, SDG&E would limit roads constructed parallel to streambeds or washes to a maximum length of 500 feet at any one transmission line crossing location. Such parallel roads would be constructed in a manner that minimizes potential adverse impacts on “waters of the U.S.” or waters of the state. Culverts would be installed where needed for right angle crossings, but rock crossings would be utilized across most right angle drainage crossings. All construction and maintenance activities would be conducted in a manner that would minimize disturbance to vegetation, drainage channels and stream banks (e.g., structures would not be located within a stream channel, construction activities would avoid sensitive features). Prior to construction in streambeds and washes, SDG&E would perform a pre-

activity survey, or more as appropriate, to determine the presence or absence of threatened or endangered riparian species.

1.5.6 Prohibit Littering

Littering is not allowed. Project personnel would not deposit or leave any food or waste in the project area, and no biodegradable or non-biodegradable debris would remain in the right-of-way following completion of construction. All refuse would be placed in appropriate wildlife-proof containers and removed from job sites regularly.

1.5.7 Delineate Listed and Proposed Species Plant Populations

Prior to construction, plant population boundaries designated as listed or proposed by USFWS or CDFG and other resources designated as listed or proposed by SDG&E and other resource agencies would be clearly delineated with clearly visible flagging or fencing, which will remain in place for the duration of construction. Flagged areas would be avoided to the extent practicable during construction activities in that area. Where these areas cannot be avoided, focused surveys for covered plant species will be performed. Notification of presence of any covered plant species to be removed in the work area would occur within ten (10) working days prior to Project activity, during which time the USFWS or CDFG may remove such plant(s) or recommend measures to minimize or reduce the take. If neither USFWS nor CDFG has removed such plant(s) within ten (10) working days following written notice, SDG&E may proceed with work.

1.5.8 Survey Areas for Brush Clearing

Brush clearing around any project facilities (e.g., structures, substations) for fire protection, visual inspection or project surveying, in areas which have been previously cleared or maintained within a two-year or shorter period will not require a pre-activity survey. In areas not cleared or maintained within a two-year period, brush clearing will not be conducted during the breeding season (March through August) without a pre-activity survey for vegetation containing active nests, burrows, or dens. The pre-activity survey performed by the on-site biological resource monitor would make sure that the vegetation to be cleared contains no active migratory bird nests, burrows, or active dens prior to clearing. If occupied migratory bird nests are present, fire protection or visual inspection brush clearing work would be avoided until after the nesting season, or until the nest becomes inactive. If no nests are observed, clearing may proceed. Where burrows or dens are identified in the reconnaissance-level survey, soil in the brush clearing area would be sufficiently dry before clearing activities occur to prevent mechanical damage to burrows that may be present.

1.5.9 Protect Wildlife

No wildlife, including rattlesnakes, may be harmed except to protect life and limb. Firearms will be prohibited in all Project areas except for those used by security personnel.

1.5.10 Prohibit Feeding of Wildlife

Feeding of wildlife is not allowed.

1.5.11 Prohibit Pets in the Project Area

Project personnel are not allowed to bring pets to any Project area in order to minimize harassment or killing of wildlife and to prevent the introduction of destructive animal diseases to native wildlife populations.

1.5.12 Prohibit Collection of Plants or Wildlife

Plant or wildlife species will not be collected except by biological monitors specifically directed by USFWS or CDFG to do so.

1.5.13 Cover All Steep-walled Trenches or Excavations Used During Construction to Prevent the Entrapment of Wildlife

All steep-walled trenches or excavations used during construction will be covered at all times except when being actively utilized. If the trenches or excavations cannot be covered, exclusion fencing (i.e., silt fencing) will be installed around the trench or excavation, or it will be covered to prevent entrapment of wildlife. Open trenches, or other excavations that could entrap wildlife will be inspected by the qualified biologist a minimum of three times per day and immediately before backfilling. Should a dead or injured listed species be found in a trench or excavation or anywhere in the construction zone or along an access road, the qualified biologist will contact the CPUC, BLM, USFS, and the Wildlife Agencies within 48 hours of the finding. The qualified biologist will report the species found, the location of the finding, the cause of death (if known), and will submit a photograph and any other pertinent information.

Construction holes left open over night will be covered. Covers will be secured in place nightly, prior to workers leaving the site, and will be strong enough to prevent livestock or wildlife from falling through and into a hole. Holes and/or trenches will be inspected prior to filling to ensure absence of mammals and reptiles. Excavations will be sloped on one end to provide an escape route for small mammals and reptiles.

1.5.14 Emergency Repairs

Emergency repairs may be required during the construction and maintenance of the project to address situations (e.g., downed lines, slides, slumps, major subsidence, etc.) that potentially or immediately threaten the integrity of the project facilities. During emergency repairs the AMMs will be followed to the fullest extent practicable. Once the emergency has been abated, any unavoidable environmental damage would be reported to the project biological construction monitor, who would promptly submit a written report of such impacts to the USFWS and CDFG and any other government agencies having jurisdiction over the emergency actions. If required by the government agencies, the biological construction monitor would develop a reasonable and feasible mitigation plan consistent with the AMMs and any permits previously issued for the project by the governmental agencies.

1.5.15 Avoid Sensitive Features

In areas designated as sensitive by SDG&E or the resource agencies, to the extent feasible, structures and access roads would be designed to minimize impacts to sensitive features. These areas of sensitive features include but are not limited to high-value wildlife habitats, sensitive vegetation communities, and high value plant habitats. If the sensitive features cannot be completely avoided or spanned, structures and access roads would be placed to minimize the disturbance to the extent feasible. When it is not feasible to avoid constructing poles or access roads in high value wildlife habitats, SDG&E would perform a site survey to determine presence or absence of endangered species in sensitive habitats. SDG&E would submit results of this survey to the USFWS prior to constructing structures or access roads. Where it is not feasible for access roads to avoid sensitive water resource features, such as streambed crossings, such crossings would be built at right angles to the streambeds. Where such crossings cannot be made at right angles, roads constructed parallel to streambeds would be limited to a maximum length of 500 feet at any one transmission line crossing location.

1.5.16 Protect and Restore Vegetation

In construction areas where grading or recontouring is not required, vegetation will be left in place wherever possible to avoid excessive root damage and allow for re-sprouting.

Only the minimum amount of vegetation necessary for the construction of structures and facilities will be removed. Topsoil located in areas containing sensitive habitat will be conserved during excavation and reused as cover on disturbed areas to facilitate re-growth of vegetation. Topsoil located in developed or disturbed areas is excluded from this measure.

Disturbed soils will be re-vegetated with an appropriate seed mix that does not contain invasive, non-native plant species.

1.5.17 Salvage Listed or Proposed Species for Replanting or Transplanting

Species identified as listed or proposed by the land managing agency will be salvaged where avoidance is not feasible in accordance with State law. Generally, salvage may include removal and stockpiling for replanting on site, removal and transplanting out of surface disturbance area, removal and salvage by private individuals, and removal and salvage by commercial dealers, or any combination.

1.5.18 Reduce Construction Night Lighting on Habitats Supporting Listed or Proposed Species

Exterior lighting within the project area adjacent to preserved habitat will be of the lowest illumination allowed for human safety, selectively placed, shielded, and directed away from preserved habitat to the maximum extent practicable. Vehicle traffic associated with project activities would be kept to a minimum volume and speed to prevent mortality of nocturnal wildlife species that may be moving about.

1.5.19 Conduct Biological Monitoring

A qualified biologist will monitor all work areas to ensure that all impacts occur within designated limits. Monitoring entails communicating with contractors, taking daily notes, and ensuring that the requirements of the AMMs and mitigation measures are being met by being present during construction activities including all initial grubbing and clearing of vegetation. Additionally, a qualified biologist employed by SDG&E will be present during maintenance involving ROW repair requiring ground disturbance (i.e., grading/repair of access road and work areas and spot repair of areas subject to flooding or scouring). Biological monitoring of these maintenance activities is to prevent impacts to vegetation communities or wildlife habitat not within the permanent project impact footprint or to record and report unauthorized impacts outside the footprint to the CPUC, BLM, USFS (for sections of the Project that require monitoring on National Forest lands), and the Wildlife Agencies to ensure the unauthorized impacts are mitigated. The qualified biologist will conduct monitoring for any area subject to disturbance from construction activities. The qualified biologist will perform periodic inspections of construction once or twice per week, as defined by the Wildlife Agencies, depending on the sensitivity of the resources. The qualified biologist will send weekly monitoring reports to the CPUC and BLM and will record any reduction or increase in construction impacts so that mitigation requirements can be revised accordingly. The final impact/mitigation calculations will be submitted to the CPUC, BLM, USFS (for sections

of the Project that require monitoring on National Forest lands), and the Wildlife Agencies for review and approval. The qualified biologist will send annual monitoring reports of maintenance activities to the CPUC, BLM, and USFS (for sections of the Project that require monitoring of maintenance activities on National Forest lands) that describe the types of maintenance that occurred, at what locations they occurred, and whether or not there were unauthorized impacts that require mitigation.

SDG&E, its contractors and subcontractors, and their respective project personnel, will refer all environmental issues, including wildlife relocation, sick or dead wildlife, hazardous waste, or questions about environmental impacts to the qualified biologist. Experts in wildlife handling (e.g., Project Wildlife) may need to be brought in by the qualified biologist for assistance with wildlife relocations.

The qualified biologist will have the authority to issue stop work orders if any part of the AMMs are being violated. The qualified biologist will immediately notify the CPUC, BLM, USFS and the Wildlife Agencies of any significant events discovered during the monitoring. Reinitiation of work following a stop work order will only occur when the CPUC, BLM, USFS, and the Wildlife Agencies are satisfied that the impacts have been fully documented, that compensation for these impacts will be made, and that any additional protection measures they deem necessary will be undertaken.

1.5.20 Provide Restoration/Compensation for Affected Habitat Communities Supporting Listed or Proposed Species

To the extent practicable, surface-disturbing components of the project will be located in previously disturbed areas or where habitat quality is poor, so that disturbance of vegetation and soils can be minimized. Temporary construction mats may be used to minimize vegetation and soil disturbance only where deemed appropriate by the qualified biologist. The construction mats will not be left on the ground for more than three weeks. Use of construction mats will be considered a temporary impact to vegetation and will be mitigated in accordance with this mitigation measure. If avoidance of habitat communities supporting listed or proposed species is not feasible due, for example, to physical or safety constraints, SDG&E will restore temporarily impacted areas to pre-construction conditions following construction (or emergency repairs) and will permanently block off all public access to them, and/or will purchase/dedicate suitable habitat for preservation to off-set permanently impacted areas. Any area that can be preserved as intact or restored habitat, or if it contains any species (plant or animal) that require project-related compensatory mitigation will qualify as off-site mitigation lands. Restoration of some habitats in temporarily impacted areas may not be possible if those areas are subject to vegetation management to maintain proper clearance between transmission lines and vegetation. In those instances, the mitigation will consist of off-site acquisition and preservation of the vegetation community instead. Restoration involves recontouring the land, replacing the topsoil (if it was collected), planting seed and/or container stock, and maintaining (i.e., weeding, replacement planting,

supplemental watering, etc.) and monitoring the restored area for a period five years (or less if the restoration meets all success criteria). The success of the restoration is usually based on how the habitat compares with similar, nearby, undisturbed habitat. Any restoration efforts would be subject to a Habitat Restoration Plan approved by the CPUC, BLM, Wildlife Agencies, and USFS. The mitigation ratios also apply to impacts from emergency repairs. In cases where the impacts to sensitive vegetation communities occur on lands already in use as mitigation for other projects, the mitigation ratios will be doubled, as is standard practice in San Diego County.

All limits of construction will be delineated with orange construction fencing. During and after construction, entrances to access roads will be gated to prevent the unauthorized use of these roads by the general public. Signs prohibiting unauthorized use of the access roads will be posted on these gates.

Areas to be restored will include all areas temporarily impacted by construction, such as tower construction sites, laydown/staging areas, temporary access and spur roads, and existing tower locations where towers are removed. Where on-site restoration is planned, SDG&E will identify a qualified Habitat Restoration Specialist to be approved by the CPUC, BLM, USFS, and the Wildlife Agencies. The Habitat Restoration Specialist will prepare and implement a Habitat Restoration Plan, for restoring temporarily impacted sensitive vegetation communities, to be approved by the CPUC, Wildlife Agencies, BLM, and USFS. SDG&E will work with the CPUC, BLM, and Wildlife Agencies until a plan is approved by all. This Habitat Restoration Plan must be approved in writing by the above-listed agencies prior to the initiation of any vegetation disturbing activities. Hydroseeding, drill seeding, or an otherwise proven restoration technique will be utilized on all disturbed surfaces using a locally endemic native seed mix approved by the CPUC, Wildlife Agencies, BLM, and USFS. The Habitat Restoration Plan will incorporate the measures identified in the May 25, 2006 Memorandum of Understanding (MOU) among Edison Electric Institute, USFS, BLM, USFWS, National Park Service, and the Environmental Protection Agency (Edison Electric Institute *et al*. 2006) where applicable.

The Habitat Restoration Plan will incorporate Desert Bioregion Revegetation/Restoration Guidance measures for restoration of temporary impacts to desert scrub and dune habitats. These measures generally include alleviating soil compaction, returning the surface to its original contour, pitting or imprinting the surface to allow small areas where seeds and rain water can be captured, planting seedlings that have acquired the necessary root mass to survive without watering, planting seedlings in the spring with herbivory cages, broadcasting locally collected seed immediately prior to the rainy season, and covering the seeds with mulch.

The restoration of habitat will be maintained and monitored for five years after installation by an experienced, licensed Habitat Restoration Contractor, or until established success criteria identified in the Restoration Plan (specified percent cover of native and nonnative species, species diversity, and species composition as compared

with an undisturbed reference site) are met. Maintenance and monitoring will be conducted following a prescribed schedule to assess progress and identify potential problems with the restoration. Remedial action (e.g., additional planting, weeding, erosion control, use of container stock, supplemental watering, etc.) will be taken by an experienced, licensed Habitat Restoration Contractor during the maintenance and monitoring period if necessary to ensure the success of the restoration. If the restoration fails to meet the established success criteria after the maintenance and monitoring period, maintenance and monitoring will extend beyond the five-year period until the criteria are met or unless otherwise approved by the CPUC, BLM, USFS and the Wildlife Agencies. For areas where habitat restoration cannot meet mitigation requirements, as determined by the Habitat Restoration Specialist in coordination with CPUC, BLM, USFS (for sections of the Project with restoration on National Forest lands), and the Wildlife Agencies, off-site purchase and dedication of habitat will be provided.

1.5.21 Prepare and Implement a Weed Control Plan

SDG&E will prepare and implement a comprehensive, adaptive Weed Control Plan for pre-construction and long-term invasive weed abatement. Where SDG&E owns the ROW property, the Weed Control Plan will include specific weed abatement methods, practices and treatment timing developed in consultation with the San Diego County Agriculture Commissioner's Office and the California Invasive Plant Council (Cal-IPC). On the ROW easement lands administered by public agencies (BLM, USFS, and Wildlife Agencies) the Weed Control Plan will incorporate all appropriate and legal agency-stipulated regulations. The Weed Control Plan will be submitted to the ROW land-holding public agencies for final authorization of weed control methods, practices, and timing prior to implementation of the Weed Control Plan on public lands. ROW easements located on private lands will include adaptive provisions for the implementation of the Weed Control Plan. Prior to implementation, SDG&E will work with the landowners to obtain authorization of the weed control treatment that is required. Developed land will be excluded from weed control.

The Weed Control Plan will include the following:

- A pre-construction weed inventory will be conducted by surveying the entire ROW and areas immediately adjacent to the ROW (where access and permission can be secured) as well as at all ancillary facilities associated with the project for weed populations that: (1) are considered by the San Diego County Agriculture Commissioner as being a priority for control and (2) aid and promote the spread of wildfires (such as cheatgrass [*Bromus tectorum*], Saharan mustard [*Brassica tournefortii*] and medusa head [*Taeniatherum caput-medusae*]). These populations will be mapped and described according to density and area covered. These plant species will be treated (where access and permission can be secured) prior to construction or at a time when treatments would be most effective based on phenology according to control methods and practices for invasive weed

populations designed in consultation with the San Diego County Agriculture Commissioner's Office and Cal-IPC, as appropriate.

- A pre-construction weed inventory will also be conducted by surveying areas that will be directly impacted by the project for weed populations that are rated High or Moderate for negative ecological impact in the California Invasive Plant Inventory Database (Cal-IPC, 2006). These plant species will be treated prior to construction or at a time when treatments would be most effective based on phenology according to control methods and practices for invasive weed populations designed in consultation with Cal- IPC.

- Weed control treatments will include all legally permitted chemical, manual and mechanical methods applied with the authorization of the San Diego County Agriculture Commissioner and the ROW easement land-holding agencies where appropriate. The application of herbicides will be in compliance with all state and federal laws and regulations under the prescription of a Pest Control Advisor (PCA) and implemented by a Licensed Qualified Applicator. Where manual and/or mechanical methods are used, disposal of the plant debris will follow the regulations set by the San Diego County Agriculture Commissioner. The timing of the weed control treatment will be determined for each plant species in consultation with the PCA, the San Diego County Agriculture Commissioner and Cal-IPC, with the goal of controlling populations before they start producing seeds.

  For the lifespan of the project (i.e., as long as the project is physically present), long-term measures to control the introduction and spread of noxious weeds in the project area will be taken as follows.

  - From the time construction begins until two years after construction is complete, annual surveying for new invasive weed populations and the monitoring of identified and treated populations will be required in the survey areas described above. After this time, surveying for new invasive weed populations and monitoring of identified and treated populations will be required at an interval of every two years. However, the treatment of weeds will occur on a minimum annual basis, unless otherwise approved by the PCA, the San Diego County Agriculture Commissioner, and Cal-IPC.

  - During project construction and operation/maintenance, all seeds and straw materials will be certified weed free, and all gravel and fill material will be certified weed free by the San Diego County Agriculture Commissioner's Office..

  - During project construction and operation/maintenance, vehicles and all equipment will be washed (including wheels, undercarriages, and

bumpers) at an off-site washing facility (e.g., a car wash or truck wash) immediately before and after entering all project areas construction begins and prior to returning to project construction should equipment be used in a different construction area. In addition, tools such as chainsaws, hand clippers, pruners, etc. will be washed before and after entering all project areas at an off-site washing facility immediately before project construction begins and prior to returning to project construction should tools be used in a different construction area. In addition, vehicles, tools, and equipment will be washed at an off-site washing facility should these vehicles, tools, and equipment have been used in an area where invasive plants have been mapped during the pre-construction weed control inventory and as directed by the biological construction monitor, prior to entering a project area free of populations of invasive plants (as determined by the pre-construction weed control inventory). Finally, vehicles, tools, and equipment used for maintenance will be washed at an off-site washing facility immediately before each maintenance event. All washing will take place where rinse water is collected and disposed of in either a sanitary sewer or landfill; an effort will be made to use wash facilities that use recycled water. A written daily log will be kept for all vehicle/equipment/tool washing that states the date, time, location, type of equipment washed, methods used, and staff present. The log will include the signature of a responsible staff member. Logs will be available to the CPUC, BLM, USFS (for Project sections within National Forest lands), Wildlife Agencies, and biological monitor for inspection at any time and will be submitted to the CPUC on a monthly basis during construction and submitted annually to the CPUC during operation/maintenance.

1.5.22 Conduct Arroyo Toad Surveys, and Implement Appropriate Avoidance/Minimization/Compensation Strategies

A pre-construction, USFWS protocol survey will be conducted for the arroyo toad in the construction zone (by a biologist permitted by the USFWS to handle the toad) where absence of the species has not been proven to conclusively define the impacts to occupied habitat.

The removal of toad riparian breeding habitat will occur from October through December to minimize potential impacts to breeding adults (including potential sedimentation impacts to toad eggs) and dispersing juveniles.

Where the toad is present, or assumed to be present if no pre-construction survey is conducted, the construction zone will be fenced with exclusion fencing to prevent toad access to it. The fencing will be a silt-screen type barrier comprised of a minimum 24-inch high fence with the remainder (minimum 12 inches) anchored firmly against the ground. The fence may be buried if necessary to exclude toad access. The fence

locations will be identified by a USFWS permitted biologist and adjusted as necessary. Exclusion fencing will be monitored daily by a qualified biologist and maintained in its original condition by construction personnel for the entire length of the construction period in toad habitat.

Pre- and post-exclusion fencing surveys within the construction zone will be conducted for arroyo toads by a biologist permitted by the USFWS to handle the toad. Prior to construction commencement, a minimum of three surveys will be conducted by this biologist following installation of the fencing and prior to construction activities. One of these clearance surveys must take place no more than 24 hours prior to activity commencement. These surveys will be conducted during appropriate climatic conditions and during the appropriate time of day or night to maximize the likelihood of encountering arroyo toads. If conditions are not appropriate for arroyo toad movement during surveys, the biologist may attempt to elicit a response from the toads during nights (i.e., at least one hour after sunset), provided that temperatures are above 50°F, by spraying the project area with water to simulate a rain event. After the three clearance surveys outlined above have been completed, daily surveys will be conducted each morning prior to the continuation of construction or maintenance activity. Any toads found will be relocated to appropriate similar habitat outside project impact areas.

To avoid impacts to arroyo toads during project maintenance (specifically the use and maintenance of access roads within 2 kilometers of occupied toad habitat), use and maintenance of these access roads will only occur between two hours after sunrise until two hours before sunset.

Mitigation for the loss of arroyo toad-occupied habitat will be implemented as follows. Permanent impacts to occupied, arroyo toad breeding habitat will include off-site acquisition and preservation of occupied arroyo toad breeding habitat at a 3:1 ratio. Permanent impacts to occupied, upland burrowing habitat will include off-site acquisition and preservation of occupied, upland burrowing habitat at a 2:1 ratio. Temporary impacts to occupied breeding habitat will include 1:1 on-site restoration and 2:1 off-site acquisition and preservation of occupied breeding habitat. Temporary impacts to occupied, upland burrowing habitat will include 1:1 on-site restoration and 1:1 off-site acquisition and preservation of occupied, upland burrowing habitat.

1.5.23 Conduct Quino Checkerspot Butterfly Surveys, and Implement Appropriate Avoidance/Minimization/Compensation Strategies

A biologist permitted by the USFWS will determine suitable habitat areas (i.e., non-excluded areas per the 2002 USFWS protocol (USFWS 2002)) within any designated USFWS Quino checkerspot butterfly (QCB) survey area (e.g., Survey Areas 1 and 2) that would be impacted by project construction.

A pre-construction, USFWS protocol presence/absence survey for the adult QCB will be conducted within all suitable habitat for this species in the construction zone within any designated USFWS QCB survey area. The survey will be conducted in a year where the QCB is readily observed at USFWS QCB-monitored reference sites to determine what areas are occupied by the QCB (i.e., any suitable habitat within 1 kilometer of a current QCB sighting is considered occupied) and what areas are not occupied. The USFWS permitted biologist will record the precise locations of QCB larval host plants within the construction zone (and 10 meters beyond) using GPS technology.

If the protocol pre-construction survey is conclusive for determining absence of the QCB, then areas without QCB would not require mitigation.

If the protocol pre-construction survey is not conclusive for determining QCB absence (due to limited detectability per the 2002 protocol, for example), or if a survey is not conducted, then all suitable habitat areas would be considered potentially occupied and would require mitigation as follows. If construction occurs outside the larvae and adult activity season (June 1 through October 15) and stays at least 10 meters away from all host plant locations, then no mitigation is required (USFWS 2007a). If construction occurs between October 16 and May 31 or within 10 meters of host plant locations, then (1) temporary impacts to the habitat will be mitigated through on-site restoration of temporarily disturbed areas and offsite acquisition and preservation of an equal sized area of QCB-occupied habitat (a 2:1 mitigation ratio) and (2) permanent impacts will be mitigated through off-site acquisition and preservation of QCB-occupied habitat (or QCB-designated Critical Habitat for impacts to designated Critical Habitat) at a 2:1 ratio (i.e., two acres acquired for each acre lost). Any acquired habitat will be approved by the CPUC, BLM, Wildlife Agencies, and USFS. A USFWS permitted biologist will be present during all construction activities in potentially occupied habitat to monitor and assist the construction crews to ensure impacts occur only as allowed. This same mitigation will apply where the protocol pre-construction survey was conclusive for determining that the QCB is present and where construction would occur in designated Critical Habitat. Impacts to QCB Critical Habitat must be mitigated within the same Critical Habitat Unit where the impacts occurred.

If host plant mapping is not possible during the pre-construction survey (e.g., drought prevents plant germination), then all suitable habitat (i.e., non-excluded habitat per the 2002 protocol) will be considered occupied by the QCB and mitigated under the assumption that the QCB is present.

If access roads in QCB-occupied or potentially occupied habitat are maintained (i.e., regraded) and vegetation around structures is cleared at least once every two years, then no additional mitigation will be required for this ongoing maintenance. If more than two years pass without regrading or clearing, then the maintenance will be considered a new impact to QCB habitat and will be mitigated.

1.5.24 Minimize Impacts to Desert Bighorn Sheep and Provide Compensation for Loss of Critical Habitat

With regard to timing of activities, construction and maintenance activities (including the use of helicopters) in bighorn sheep Critical Habitat will be limited to outside the lambing season and the period of greatest water need or a minimum ceiling of 1,500 for helicopter flights will be maintained The lambing season is January 1 through June 30. The period of greatest water need is May through September. Construction and maintenance activities in Critical Habitat may occur during the lambing season and/or period of greatest water need if prior approval is obtained from the Wildlife Agencies.

To help reconnect desert bighorn sheep subpopulations and at least partially offset impacts to the overall population caused by the project, SDG&E will:

- Fund the design and construction of an overpass (for sheep) or tunnel for vehicles) to facilitate desert bighorn sheep movement across a highway at a location determined by the USFWS (in coordination with CDFG). Tunnel or overpass design must be approved by the Wildlife Agencies.
- Fund removal of tamarisk and fences for the life of the project, and install and maintain water sources at locations determined by USFWS in coordination with CDFG.
- Fund a minimum 10-year-long program to monitor the effects of the project on desert bighorn sheep behavior, movements, and dispersal in the project corridor (ten years is needed to measure the influence of the project while factoring in rainfall cycles, vegetative productivity, and drought). This program would be implemented by the Wildlife Agencies following construction.

Furthermore, SDG&E will provide compensation for direct loss of critical habitat at a 5:1 ratio for permanent impacts and at a 3:1 ratio (including a combination of on-site restoration and off-site purchase) for temporary impacts with Critical Habitat or other habitat acceptable to the Wildlife Agencies and BLM.

1.5.25 Prepare and Implement a Raven Control Plan

A Raven Control Plan will be prepared and implemented for portions of the project route. The raven control plan will include the use of raven perching and nesting deterrents and will describe the procedure for obtaining a permit from the USFWS Law Enforcement Division to legally remove ravens. The plan will identify the purpose of conducting raven control; provide training in how to identify raven nests and how to determine whether a nest belongs to a raven or a raptor species; describe the seasonal limitations on disturbing nesting raptors; and describe procedures for documenting the activities on an annual basis. SDG&E will obtain approval of this plan from the USFWS.

1.5.26 Conduct Coastal California Gnatcatcher Surveys, and Implement Appropriate Avoidance/Minimization/Compensation Strategies

All brushing or grading taking place within occupied habitat of the coastal California gnatcatcher (defined as within 500 feet of any gnatcatcher sightings (USFWS 2007b)) during construction will be conducted from September 1 through February 14, which is outside the coastal California gnatcatcher breeding season.

When conducting all other construction activities during the coastal California gnatcatcher breeding season of February 15 through August 30, within habitat in which coastal California gnatcatchers are known to occur or have potential to occur, the following avoidance measures will apply.

A USFWS permitted biologist will survey for coastal California gnatcatchers within 10 days prior to initiating activities in an area. The results of the survey will be submitted to the Wildlife Agencies for review and approval prior to initiating any construction activities. If coastal California gnatcatchers are present, but not nesting, a USFWS permitted biologist will survey for nesting coastal California gnatcatchers approximately once per week within 500 feet of the construction area for the duration of the activity in that area during the breeding season.

If an active nest is located, a 300-foot no-construction buffer (USFWS 2007b) will be established around each nest site; however, there may be a reduction of this buffer zone depending on site-specific conditions or the existing ambient level of activity. The applicant will contact Wildlife Agencies to determine the appropriate buffer zone. To the extent feasible, no construction will take place within this buffer until the nest is no longer active. However, if construction must take place within the 300-foot buffer, a qualified acoustician will monitor noise as construction approaches the edge of the occupied gnatcatcher habitat as directed by the permitted biologist. If the noise meets or exceeds the 60 dB(A) Leq threshold, or if the biologist determines that the activities in general are disturbing the nesting activities, the biologist will have the authority to halt construction and will consult with the Wildlife Agencies to devise methods to reduce the noise and/or disturbance in the vicinity. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nesting coastal California gnatcatchers and the activities, and working in other areas until the young have fledged.

Mitigation for the loss of coastal California gnatcatcher-occupied habitat will be implemented as follows. Permanent impacts to occupied habitat will include off-site acquisition and preservation of occupied habitat at a 2:1 ratio. Temporary impacts to occupied habitat will be mitigated at a 2:1 ratio and will include 1:1 on-site restoration and 1:1 off-site acquisition and preservation of occupied habitat. Impacts to coastal California gnatcatcher Critical Habitat must be mitigated within the same Critical Habitat Unit where the impacts occurred.

Mitigation for the loss of unoccupied designated Critical Habitat for the gnatcatcher will be implemented as follows. Permanent impacts to unoccupied designated Critical Habitat will include off-site acquisition and preservation of designated Critical Habitat at a 2:1 ratio. Temporary impacts to unoccupied designated Critical Habitat will include 1:1 on-site restoration.

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1.5.27 Conduct Least Bell's Vireo and Southwestern Willow Flycatcher Surveys, and Implement Appropriate Avoidance/Minimization/Compensation Strategies

All grading or brushing taking place within riparian habitats of the least Bell's vireo or southwestern willow flycatcher during construction will be conducted from September 16 through March 14, which is outside the least Bell's vireo and southwestern willow flycatcher breeding seasons.

When conducting all other construction activities during the breeding season of March 15 through September 15 within 500 feet (USFWS 2007b) of habitat in which least Bell's vireos and/or southwestern willow flycatchers are known to occur or have potential to occur, a biologist permitted by the USFWS will survey for least Bell's vireos and southwestern willow flycatchers within 10 days prior to initiating activities in an area. The results of the survey will be submitted to the Wildlife Agencies for review and approval prior to initiating any construction activities.

If least Bell's vireos or southwestern willow flycatchers are present, a permitted biologist will survey for nesting vireos and flycatchers approximately once per week within 500 feet of the construction area (USFWS 2007b), for the duration of the activity in that area during the breeding season. If an active nest is located, a 300-foot no-construction buffer zone (USFWS 2007b) will be established around each nest site; however, there may be a reduction of this buffer zone depending on site-specific conditions or the existing ambient level of activity. The Applicant will contact Wildlife Agencies to determine the appropriate buffer zone. No construction will take place within this buffer until the nest is no longer active, unless there are physical or safety constraints. If construction must take place within the buffer, a qualified acoustician will monitor noise as construction approaches the edge of the occupied vireo/flycatcher habitat as directed by the permitted biologist. If the noise meets or exceeds the 60 dB(A) Leq threshold, or if the biologist determines that the activities in general are disturbing the nesting activities, the biologist will have the authority to halt construction and will consult with the Wildlife Agencies, and USFS to devise methods to reduce the noise and/or disturbance. This may include methods such as, but not limited to, turning off vehicle engines and other equipment whenever possible to reduce noise, installing a protective noise barrier between the nesting birds and the activities, and working in other areas until the young have fledged. The permitted biologist will monitor the nest daily until either activities are no longer within 300 feet of the nest, or the fledglings become independent of their nest.

Impacts to aquatic resources under the jurisdiction of the United States Army Corps of Engineers (Corps), RWQCB Regional Water Boards, State Water Board, and CDFG will be avoided to the extent feasible. The avoidance of these resources will further minimize impacts to least Bell's vireo and southwestern willow flycatcher.

Mitigation for the loss of occupied least Bell's vireo or southwestern willow flycatcher habitat (or designated Critical Habitat for the flycatcher) will be implemented as follows. Permanent impacts to occupied habitat or designated Critical Habitat will include offsite acquisition and preservation of occupied habitat or designated Critical Habitat at a 3:1 ratio. Temporary impacts to occupied habitat or designated Critical Habitat will include 1:1 on-site restoration and 2:1 off-site acquisition and preservation of occupied habitat or designated Critical Habitat. Impacts to least Bell's vireo or southwestern willow flycatcher Critical Habitat must be mitigated within the same Critical Habitat Unit where the impacts occurred.

1.5.28 Prepare Habitat Management Plans for all Mitigation Habitat

All off-site mitigation parcels will be approved by the CPUC, BLM, Wildlife Agencies, and USFS (for alternatives with impacts to National Forest lands) and must be acquired or their acquisition must be assured before the line is energized. To demonstrate that such parcels will be acquired, SDG&E will submit a Habitat Acquisition Plan at least 120 days prior to any ground disturbing activities. The Plan will be submitted to the CPUC, BLM, the Wildlife Agencies, and USFS (for impacts on National Forest Lands) for review and approval, and will include, but will not be limited to: legal descriptions and maps of all parcels to be acquired; schedule that includes phasing relative to impacts; timing of conservation easement recording; initiation of habitat management activities relative to acquisition; and assurance mechanisms (e.g., performance bonds to assure adequate funding) for any parcels not actually acquired prior to vegetation disturbing activities.

Habitat Management Plans for any required, off-site mitigation will be prepared by biologists approved by the CPUC, BLM, Wildlife Agencies, and USFS. The Habitat Management Plans must be approved in writing by the CPUC, BLM, Wildlife Agencies, and USFS prior to the initiation of any vegetation clearing activities. The Habitat Management Plans will provide direction for the preservation and in-perpetuity management of all acquired habitat.

Management specifications including, but not limited to, regular biological surveys to compare with baseline; exotic, non-native species control; fence/sign replacement or repair, public education; trash removal; and annual reporting to CPUC, BLM, Wildlife Agencies, and USFS (for mitigation habitat located on National Forest Lands) will be included in the Habitat Management Plans.

1.5.29 Check Under Vehicles for Wildlife

Employees and contractors will look under vehicles and equipment for the presence of wildlife before movement. If wildlife is observed, no vehicles or equipment would be moved until the animal has left voluntarily or is removed by the qualified biologist.

1.5.30 Implement Erosion Control Practices

Project construction activities will be designed and implemented to avoid or minimize new disturbance, erosion on manufactured slopes, and off-site degradation from accelerated sedimentation. Maintenance of cut and fill slopes created by project construction activities would consist primarily of erosion repair. Where revegetation is necessary to improve the success of erosion control, planting or seeding with native seed mix would be done on slopes.

In addition to the measures above, the following erosion control procedures will be implemented:

1) Vehicle and construction equipment use will be restricted to access roads and areas in the immediate vicinity of construction work sites to help reduce soil disturbance.
2) In agricultural areas, topsoil would be left in roughened condition.
3) When practical, construction activities will be avoided on wet soil to reduce the potential for soil compaction, rutting, and loss of soil productivity.
4) Disturbed areas will be returned to their pre-construction contours and allowed to revegetate naturally, or will be reseeded with an appropriate seed mixture if necessary.
5) Construction of access roads in inaccessible terrain will be reduced by using helicopters to place structures in select locations.

1.5.31 Restore Surfaces for Erosion Control and Revegetation

In areas where ground disturbance is substantial or where re-contouring is required (e.g., marshaling yards, tower sites, spur roads from existing access roads), surface restoration will occur as necessary for erosion control and revegetation. The method of restoration will normally consist of returning disturbed areas back to their original contour, reseeding (if required), installing cross drains for erosion control, placing water bars in the road, and filling ditches for erosion control. Potential for erosion will be minimized on access roads and other locations primarily with water bars. The water bars will be constructed using mounds of soil shaped to direct the flow of runoff and prevent erosion. Soil spoils created during ground disturbance or recontouring will be disposed of only on previously disturbed areas, or used immediately to fill eroded areas. Cleared vegetation can be hauled off-site to a permitted disposal location, or may be chipped or shredded to an

appropriate size and spread in disturbed areas of the ROW with the approval of the biological monitor. To limit impact to existing vegetation, appropriately sized equipment (e.g., bulldozers, scrapers, backhoes, bucket-loaders, etc.) will be used during all ground disturbance and re-contouring activities.

1.5.32 Suppress Dust At All Work or Staging Areas and On Public Roads

SDG&E will: (a) pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas if construction activity causes persistent visible emissions of fugitive dust beyond the work area; (b) pre-water sites for 48 hours in advance of clearing; (c) reduce the amount of disturbed area where possible; (d) all dirt stock-pole areas should be sprayed daily as needed; (e) cover loads in haul trucks or maintain at least six inches of free-board when traveling on public roads; (f) pre-moisten, prior to transport, import and export dirt, sand, or loose materials; (g) sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets or wash trucks and equipment before entering public streets; (h) plant vegetative ground cover in disturbed areas as soon as possible following construction; (i) apply chemical soil stabilizers or apply water to form and maintain a crust on inactive construction areas (disturbed lands that are unused for four consecutive days); and (j) prepare and file with the Imperial County Air Pollution Control District, San Diego Air Pollution Control District, BLM, and CPUC a Dust Control Plan that describes how these measures would be implemented and monitored at all locations of the project.

In addition to the above measures, the following dust reduction measures will be implemented:

- Prohibit construction grading on days when the wind gusts exceed 25 mph to the extent feasible to control fugitive dust.
- All trucks hauling soil and other loose material will be covered or maintain at least two feet of freeboard.
- Snow fence-type windbreaks will be erected in areas identified as needed by SDG&E.
- Vehicle speeds will be limited to 15 mph on unpaved (no gravel or similar surfacing material) roads.
- Unpaved roads will be treated by watering as necessary.
- Soil stabilizers will be applied to inactive construction areas on an as-needed basis.
- Exposed stockpiles of soil and other excavated materials will be contained within perimeter silt fencing, watered, treated with soil binders, or covered as necessary.

1.5.33 Develop and Implement Construction Best Management Practices

The following Construction BMPs will be followed throughout construction of the Project:

1) Adequate distance from stream banks and beds will be maintained during construction activities. Construction activities will use existing bridges to cross major streams and culverts in most dry intermittent streams.
2) Surface water, riparian areas and floodplains will be spanned where feasible.
3) A Storm Water Pollution Prevention Plan (SWPPP) will be prepared and implemented.
4) Storm Water BMPs for construction will be implemented per the requirements of the project's SWPPP.
5) Silt fencing, straw mulch, straw bale check dams would be installed as appropriate to contain sediment within construction work areas and staging areas. Where soils and slopes exhibit high erosion potential, erosion control blankets, matting, and other fabrics and/or other erosion control measures.
6) The potential for increased sediment loading will be minimized by limiting road improvements to those necessary for project construction, operation and maintenance.
7) Upland pull sites will be selected to minimize impacts to surface waters, riparian areas, wetlands and floodplains.
8) Structures will not be placed in streambeds or drainage channels to the extent feasible.

1.5.34 Comply with NPDES Regulations

Secure any required General Permit for Storm Water Discharges Associated with Construction Activity (National Pollutant Discharge Elimination System (NPDES permit) authorization from the State Water Resources Control Board and/or the RWQCB to conduct construction-related activities to build the project and establish and implement a SWPPP during construction to minimize hydrologic impacts.

1.5.35 Implement Appropriate Avoidance/Minimization/Compensation Strategies for San Diego Thornmint

Impacts to San Diego thornmint will first be avoided where feasible, and, where not feasible, impacts will be compensated through salvage and relocation via a restoration program and/or off-site acquisition and preservation of habitat containing the plant at a 2:1 ratio. Avoidance may not be feasible due to physical or safety constraints. The CPUC, BLM, USFS and the Wildlife Agencies will decide whether the applicant can restore San Diego thornmint populations or will acquire habitat with San Diego thornmint (locations to be approved by the CPUC, BLM, USFS and the Wildlife Agencies). A qualified biologist will prepare a Restoration Plan that will indicate where restoration would take place. The restoration plan will also identify the goals of the restoration,

responsible parties, methods of restoration implementation, maintenance and monitoring requirements, final success criteria, and contingency measures. The applicant will work with the CPUC, BLM, Wildlife Agencies, and USFS until a plan is approved by all.

1.5.36 Conduct Stephens' kangaroo rat surveys, and implement appropriate avoidance/minimization/ compensation strategies

A pre-construction, USFWS protocol survey shall be conducted for the SKR by a USFWS permitted biologist in the construction zone where absence of the species has not been proven to conclusively define the impacts to occupied habitat. In the absence of this survey data, the mitigation acreages required below shall stand. Where the preconstruction survey determines the species is absent, the mitigation shall be reduced accordingly.

Where the SKR is present (or if no pre-construction survey is conducted, and the SKR is assumed to be present), prior to vegetation clearing or other ground-disturbing activities, the construction zone shall be fenced to provide a barrier that excludes the SKR from the construction zone and delineates the work area. A USFWS permitted SKR biologist shall be present when the fence is installed to minimize habitat disturbance.

The fence shall be constructed of ¼-inch gauge hardware cloth backed by silt fencing or other material if approved by the USFWS. No gaps greater than 0.5 inches shall be allowed within the exclusion fencing. The qualified biologist (see Mitigation Measure B-1c) or other designated personnel shall check the fencing at the end of each work day. If gaps greater than 0.5-inch are detected, they shall be repaired immediately. The exclusion fencing shall remain in place and be maintained without gaps until project construction is completed.

Immediately preceding vegetation clearing or other ground-disturbing activities within the fenced areas, live-trapping of the SKR shall be conducted by the USFWS permitted biologist for a minimum of five nights. Trapping locations shall be selected at the discretion of the biologist in coordination with the USFWS. Trapped animals shall be released outside the fenced area in appropriate habitat. Results of the trapping effort shall be provided to the CPUC, BLM, and Wildlife Agencies within 24 hours of trapping completion.

Any pipes stored during construction shall be capped prior to the end of each work day to prevent SKR from entering the pipes. A five mile-per-hour speed limit shall be observed on all access roads in SKR habitat, and vehicles shall be prohibited from using access roads in SKR habitat between one hour before sunset and one hour after dawn except in emergencies.

Mitigation for the loss of occupied SKR habitat shall be implemented as follows. Permanent impacts to occupied habitat shall include offsite acquisition and preservation

of occupied habitat at a 2:1 ratio. Temporary impacts to occupied habitat shall include 1:1 onsite restoration and 1:1 offsite acquisition and preservation of occupied habitat.

1.6 Interrelated and Interdependent Actions

No interrelated or interdependent actions, as defined under the section 7 consultation regulations, have been identified for this consultation. The FEIR/FEIS prepared for the Project identified the contemplated construction of the Jacumba substation as a "connected action" as that term is defined under the California Environmental Quality Act (CEQA) and National Environmental Policy Act (NEPA).

The section 7 regulations define interrelated actions as "those that are part of a larger action and depend on the larger action for their justification." The regulations define interdependent actions as "those that have no independent utility apart from the action under consideration" (50 C.F.R. § 402.02).

The agency Handbook states that the "but for" test should be applied to determine if an action is interrelated or interdependent:

> As a practical matter, the analysis of whether other activities are interrelated to, or interdependent with, the proposed action under consultation should be conducted by applying a "but for" test…. whether another activity in question would occur "but for" the proposed action under consultation…. If the answer is "yes," that the activity in question would occur regardless of the proposed action under consultation, then the activity is not interdependent or interrelated and would not be analyzed with the effects of the action under consultation (USFWS 1998).

The Jacumba substation would be constructed by SDG&E absent the Sunrise Powerlink and the need for the substation is not dependent upon the Sunrise Powerlink for its justification. As a result, the Jacumba substation is not an interrelated or interdependent action for purposes of section 7 consultation and will not be included in this Biological Assessment.

1.7 Required Federal Agency Authorizations

The Project would traverse BLM-administered land and SDG&E has applied for a ROW grant from BLM to implement the project. Section 501(a) of the Federal Land Policy Management Act of 1976 (FLPMA) authorizes the Secretary of the Interior to grant, issue, or renew rights-of way through public lands, except designated wilderness, for a variety of facilities, including systems for generation, transmission, and distribution of

electric energy (43 U.S.C. § 1761(a)(4)). Action on the part of BLM will be to respond to the application for a ROW grant.

Similar to the BLM, the Forest Service's action would be to respond to an application from SDG&E for a Special Use authorization to construct, maintain, and use a transmission line and ancillary improvements through the Cleveland National Forest. The FLPMA provides authority to the Secretary of Agriculture to issue, renew, or grant authorizations to occupy, use, or traverse National Forest System lands, except designated wilderness, for the generation, transmission, and distribution of electrical power (43 U.S.C. § 1761).

The Project would include a reconductor over a portion of MCAS Miramar. Although no discretionary action is required on the part of the Department of Defense for SDG&E to undertake the reconductoring on MCAS Miramar, the potential effects are included in this consultation.

Under the Clean Water Act, the action on the part of the Corps would be to respond to an application from SDG&E for authorization to fill waters of the United States under section 404.

This consultation is intended to address the actions of the BLM, USFS, and the Corps in responding to applications for approval from SDG&E related to the Sunrise Powerlink.

1.8 Consultation History

July 9, 2008: BLM transmitted a letter to USFWS designating SDG&E as the non-federal agency representative for the section 7 consultation for the Sunrise Powerlink project.

July 17, 2008: Meeting with USFWS, USFS, BLM, and SDG&E to discuss aspects of the project and proposed conservation measures.

August 15, 2008: SDG&E transmitted a letter to USFWS identifying listed and proposed species to be included in the consultation.

October 15, 2008: Meeting with USFWS, USFS, BLM, and SDG&E to discuss development of the biological assessment for the project and proposed consultation timelines, with USFS and BLM participating by speaker phone.

2.0 ACTION AREA

The Action Area for the proposed project includes the various segments that make up the 120 mile ESSR in southern San Diego County as well as several system upgrades described in Section 1.2.4 (see Figure 5). The Action Area consists of a right-of-way that is 200 feet in width for 91 miles, 300 feet in width for 23 miles (except for six miles where it is underground), and 100 feet in width for six miles in an existing ROW. New access roads, temporary work areas, pull and tension sites, fly yards, and staging areas that are outside of the right-of-way are included in the Action Area.

Using the CEQA/NEPA definition of "indirect effects," the FEIR/FEIS for the Project identified a proposed action in Mexico called "La Rumorosa Wind Developers II" as an indirect effect of the Project. The Action Area for this consultation does not include the proposed action in Mexico, however, because it does not meet the ESA definition of indirect effects. Under the section 7 regulations, indirect effects are defined as effects "that are caused by the proposed action and are later in time, but still are reasonably certain to occur." Because La Rumorosa would connect to the existing Southwest Powerlink, the causal link between La Rumorosa and the Project is insufficient to meet the definition of indirect effects. In addition, La Rumorosa is not reasonably certain to occur because significant regulatory hurdles remain, including approval by the CPUC, United States Department of Energy (DOE), and the government of Mexico.

3.0 LISTED AND PROPOSED SPECIES POTENTIALLY OCCURRING IN THE ACTION AREA

3.1 Listed and Proposed Plant and Wildlife Species Not Likely Adversely Affected

The Project may affect, but is not likely to adversely affect Del Mar manazanita, willowy monardella, and California red-legged frog because the species do not occur in the Action Area.

3.1.1 Del Mar Manzanita (*Arctostaphylos glandulosa ssp. Crassifolia*)

Del Mar manzanita is a medium sized shrub in the Heath (Ericaceae) Family. It is a member of the *A.glandulosa* complex which is characterized by leafy bracts that subtend the inflorescences and the presence of a burl at the root crown that allows the species to resprout after fires or mechanical disturbances. Del Mar manzanita is distinguished from other taxa of the *A.glandulosa* complex by the presence of long white hairs on petioles, twigs, rachises, and bracts and the absence of glandular hairs. There is a consistent dimorphism for the presence of these long white hairs or bristles as about half of the populations possess this trait while the other half lacks it (Wells 1986; Hickman 1993). Del Mar manzanita is sympatric at some localities with *A.g. ssp. zacaensis* but *A.g. ssp. zacaensis* is distinguishable from the Del Mar manzanita by the presence of glandular hairs (Wells 1986).

Del Mar manzanita was listed as federally endangered on October 7, 1996 (CDFG 2008a). There is no critical habitat designated for this species.

Approximately 85 individuals of Del Mar manzanita were documented within the Action Area during focused rare plant surveys in 2007 (Arcadis 2008). These individuals occur between MP-129 and MP-130, but will not be affected by the Project.

3.1.2 Willowy Monardella (*Monardella viminea)*

Willowy monardella is a small subshrub in the Mint (Lamiaceae) Family. The bi-labiate flowers are white to rose, blooming from June to August (Hickman 1993; Reiser 2001). Riparian scrub, usually at sandy locales in seasonally dry washes is the typical habitat. Canopy cover is generally absent and river cobbles may be present. Scattered western sycamores (*Platanus racemosa*) may also be present. Willowy monardella typically occurs along the periphery, e.g. channel edges, of these seasonal or intermittent streams and may be adapted to occasional flooding episodes to expand local populations downstream along newly created embankments of cobble and silty materials (Reiser 2001).

Willowy monardella (*Monardella viminea*) was listed as federally endangered on October 13, 1998 and state endangered in January 1979 (CDFG 2008a).
This species was not observed within the Action Area during focused rare plant surveys in 2007 or 2008, despite the close proximity of known populations. During the 2008 focused rare plant surveys, willowy monardella was documented in an unnamed tributary to Sycamore Canyon just downstream of the Action Area (between Structure # I-16 and Structure # I-17, between MPs 116 and 117).

The Action Area does not contain critical habitat for willowy monardella. A total of 73 acres along Sycamore Canyon, south of the Action Area, has been designated as critical habitat (USFWS 2006). This species is not likely to be adversely affected by the Project because it was not recorded in the Action Area and no Critical habitat for the species is found in the Action Area.

3.1.3 California Red-legged Frog (*Rana aurora draytonii*)

The California red-legged frog is one of two subspecies of the red-legged frog and is the largest native frog in the western U.S. It is a member of the Family Ranidae. This species requires a variety of habitat elements with aquatic breeding areas embedded within a matrix of riparian and upland dispersal habitats. The California red-legged frog is endemic to California and Baja California Mexico. As of 2002 this species was only known from 256 streams or drainages in 28 counties in California. Although USFS has modeled sutiable habitat (Figure 6), this species is no longer known from San Diego County and is reported from only one location in Riverside County. This species is

threatened within its remaining range by urban encroachment, construction of reservoirs and water diversion projects, contaminants, agriculture, livestock grazing, predators and non-native competitors (USFWS 2002). California red-legged frog was listed as federally threatened on May 20. 1996. On April 12, 2001 the USFWS designated critical habitat. Legal action on November 6, 2002 resulted in most of the critical habitat units being vacated. On May 15, 2006, the USFWS proposed critical habitat with revised boundaries. The USFWS finalized the recovery plan for the California red-legged frog in 2002 (CDFG 2008b). This species is not likely to be adversely affected by the Project because its current range does not include San Diego and Imperial counties, and as such is a does not occur in the Action Area.

3.2 Listed and Proposed Plant Species Potentially Affected

Ten species, San Diego thornmint, San Bernardino bluegrass, quino checkerspot butterfly, Laguna Mountains skipper, arroyo toad, southwestern willow flycatcher, coastal California gnatcatcher, least Bell's vireo, Stephens' kanagaroo rat, and desert bighorn sheep may be adversely affected by the proposed action.

3.2.1 San Diego Thornmint (*Acanthomintha ilicifolia*)

Status: Federal Threatened; State Endangered

Background

San Diego thornmint was listed as federally threatened on October 13, 1998 and state endangered in January 1982 (CDFG 2008a). The USFWS designated Critical Habitat for San Diego thornmint on August 26, 2008 (USFWS 2008).

Life History

San Diego thornmint is a small (5-15 centimeter), aromatic annual of the Mint (Lamiaceae) Family. The bi-labiate flowers are white, sometimes rose-tinged. The inflorescences are subtended by spine-tipped scarious bracts, which give the genus its name (Hickman 1993).

San Diego thornmint is a winter annual that germinates during the winter rainy period, flowers in late spring (April-early June) and sets seed and dies in early summer (Bauder and Sakrison 1997; Reiser 2001). Plants vary in size from only a few centimeters tall with just a few branches to nearly 20 centimeters tall, several dozen branches and a spread of 50 centimeters when growing conditions are favorable. Flowers are produced in clusters (called glomerules) at the stem nodes. Fecundity is affected by the number of nodes, the number of flowers per node and the seeds produced per flower (Bauder and Sakrison 1997).

San Diego thornmint generally grows in open areas. Grassy openings in the chaparral or sage scrub with friable or broken clay soils are the preferred habitat of this species. Clay soils, sometimes gabbro derived, but probably of various origins, with large, deep fissures during the dry season appear to be an obligate substrate. These soils may also have a very distinct polygonal pattern of cracks. The soils' structure is crumbly, and when moist these soils often feel spongy underfoot. Native geophytes, grasses, herbaceous perennials and annuals are common associates (Bauder and Sakrison 1997).

Distribution, Abundance, and Trends

San Diego thornmint is restricted to western San Diego County and northwestern Baja California, Mexico. This species is known from Carlsbad (Palomar Airport Road), Encinitas (Manchester Avenue Mitigation Bank), Los Peñasquitos Canyon, Sycamore Canyon, Slaughterhouse Canyon, Sabre Springs, Viejas Mountain, Poser Mountain, McGinty Mountain, Hollenbeck Canyon, Wright's Field in Alpine, Otay Lakes, and Bonita Meadows (USFWS 2008; Reiser 2001).

In 1994 Bauder *et al.* surveyed 20 sites of San Diego thornmint. Populations were dense and stable on the larger sites such as those near or on Viejas Mountain (USFS land), McGinty Mountain (The Nature Conservacncy (TNC), CDFG and County of San Diego), and Sycamore Canyon (County of San Diego, CDFG). Smaller populations on public lands such as those in Peñasquitos Canyon Regional Park and Mission Trails Regional Park are subject to various forms of disturbance such as trails, erosion and dense growth of non-native weedy plants (Bauder *et al.* 1994).

Threats and Limiting Factors

San Diego thornmint may be at a competitive disadvantage where weeds are at a high density. Because it germinates at cooler temperatures than many of the herbaceous exotics, the exotics can begin growth earlier in the season, preempt space for San Diego thornmint seedlings, utilize the soil and water and shade them as they grow (Bauder and Sakrison 1997). The introduced tocalote (*Centaurea melitensis*) often occurs in association with San Diego thornmint (Reiser 2001).

Approximately one-third of populations in California have been extirpated; threatened by urbanization, road construction, vehicles, grazing, trampling, erosion, and non-native plants (CNPS 2008). By 1994, only 32 natural populations were extant out of 50 recorded occurrences and less than half of these are protected (Bauder *et al.* 1994; Bauder and Sakrison 1999).

In recent years, fires have become a more recognizable threat to the long-term persistence of rare plant populations, as even populations considered "safe" in managed preserves have been threatened or lost to fires. An estimated 15.4 percent, or 8,716 acres out of 56,659 acres of San Diego thornmint habitat in San Diego County burned during the 2003 fires (SDCBRR 2003).

Presence in the Action Area

Although populations of San Diego thornmint are known to occur in the vicinity of the Action Area on National Forest Lands, this species was not observed within the Action Area during focused rare plant surveys in 2007 or 2008 (Figure 7). Within the National Forest System lands near the Action Area, there are four occurrences of San Diego thornmint on Viejas Mountain and two occurrences on Poser Mountain, all within the Descanso Ranger District (California Natural Diversity Database 2002). These occurrences represent the eastern peripheral extension of the species' range. However, at these locations, i.e., where the Action Area is adjacent to the Poser and Viejas Mountains populations, the Proposed Project consists of an underground alternative that is to be buried within Alpine Blvd. Here the entire Action Area consists of developed land with no populations or suitable habitat present.

Not all suitable habitat within the Action Area was surveyed due to project redesign after the surveys had been conducted. Specifically, several areas within the CNF South Link at MP 78.6; between MPs 80.65 and 81.75; between MPs 82.45 and 83.2; between MPs 84.1 and 84.9, all of which support gabbro soils of the Las Posas series, were not surveyed. In 2008, rare plant surveys were conducted along the MRD Alternative as proposed within the DEIR/EIS. The Action Area deviates from the MRD Alternative in several areas by several hundred feet. Rare plant surveys conducted in 2008 along the MRD Alternative adjacent to the Action Area that occurred on gabbro soils did not observe San Diego thornmint. In addition, although appropriate gabbro soils are present, the unsurveyed portion of the Action Area is several miles east of the eastern-most known location (Hollenbeck Canyon) for the thornmint in this portion of San Diego County. For these reasons, the potential for occurrence in the unsurveyed portions of the Action Area is considered to be low.

There is no designated Critical Habitat within or immediately adjacent to the Action Area.

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3.2.2 San Bernardino Bluegrass (*Poa atropurpurea)*

Status: Federal Endangered

Background

San Bernardino bluegrass was listed as federally endangered on September 14, 1998 (USFWS 1998). The USFWS designated Critical Habitat for this species on August 14, 2008 (USFWS 2008a). This species was described by Frank Lamson-Scribner in 1898 based on two collections from Bear Valley, San Bernardino Mountains, California (USFWS 1998).

Life History

San Bernardino bluegrass is a tufted perennial of the Grass (Poaceae) Family. This species is dioecious, thus, each individual plant produces either male or female flowers only. The presence of male and female plants is necessary for sexual reproduction. San Bernardino bluegrass produces rhizomes, which allow individual plants to expand spatially (Hickman 1993).

San Bernardino bluegrass typically blooms from May through July and rarely as early as April and as late as August (CNPS 2008). It produces unisexual, panicle-like, lanceolate inflorescences. Plants vary in height from 10 to 55 centimeters and the sheath is typically open along two-thirds of the length of the leaf. The leaf blade is 1.5 to 3 millimeters wide, more or less firm, and folded (Hickman 1993). Population demography and life history parameters for this species are currently unknown (USFWS 2008b).

The preferred habitat of San Bernardino bluegrass is montane meadows or seeps surrounded by coniferous forest. Within meadows, small rocky areas may be a preferred microhabitat (Reiser 1994). This species is restricted to high elevations, approximately 1360 to 2455 meters (4460 to 8052 feet) (CNPS 2008).

Distribution, Abundance, and Trends

San Bernardino bluegrass is known from twenty occurrences throughout its range, which is restricted to San Bernardino, Riverside, and San Diego counties (CNPS 2008). This species is known from the Big Bear region of the San Bernardino Mountains, and the Laguna and Palomar Mountains of San Diego County (USFWS 1998). San Bernardino bluegrass is reported from Big Laguna Lake, near Crouch Meadows and Mendenhall Valley in the Palomar Mountains. It is also located at Big Bear Lake by Eagle Point, and nearby at Bluff Lake in the San Bernardino Mountains. Database reports for San Bernardino County are from the north shore of Baldwin Lake, the south shore of Big Bear Lake, east of Holcomb Valley, in Holcomb Valley, in Cienega Seca, at the eastern edge of Bluff Lake, just south of Meadow park, the Presbyterian Conference Grounds, the Pan Hot Springs area of Big Bear City, Shay Meadow, at Moonridge, at Wildhorse Spring, and at Erwin Lake (Reiser 1994).

During a study of San Bernardino bluegrass in the CNF, Hirshberg (1994 in USFWS 1998) found only four male plants, two male plants located at each of two different sites. It has been suggested that the San Diego County populations may have turned apomictic and no longer require fertilization to produce viable seeds (Soreng 1996 in USFWS 1998).

Threats and Limiting Factors

San Bernardino bluegrass is threatened by development, grazing, hydrological alterations, mining, recreational activities, and off-road vehicles. This species is also potentially threatened by hybridization with non-native Kentucky bluegrass (*P. pratensis*) (CNPS 2008).

Between the 1800s and 1932, meadow habitat in the Bear Valley region decreased by 76 percent. From 1932 to 1990, remaining meadow habitat decreased further by 64 percent (Krantz 1990 in USFWS 1998). Since the 1800s, there has been a 91 percent decrease in meadow habitat (Krantz 1990 in USFWS 1998).

Fire is a natural component to the regeneration of meadow habitats. The absence of fire due to the disruption of the natural fire regime allows non-native plant species that are not adapted to fire to invade these communities and outcompete San Bernardino bluegrass. The disruption of the natural fire regime has also allowed for more intense fires. Although San Bernardino bluegrass is adapted to fire, intense fires overheat soils, killing rhizomes and creating hydrophobic conditions that are detrimental to this species (Agee 1993; Keane *et al*. 2002; Arno and Fiedler 2005 in USFWS 2008b).

Presence in the Action Area

The USFS has modeled habitat for San Bernardino bluegrass (*Poa atropurpurea*) within a portion of the Action Area, specifically on a parcel of land on Mt. Laguna in eastern San Diego County (Figure 8). Several *Poa* species were observed during the habitat assessment performed on the Mt. Laguna site, but none were identified to the species level due to a lack of flowers or fruits. Several records for San Bernardino bluegrass exist for the Mt. Laguna Quadrangle (CNDDB 2008), including a 1981 specimen collected near Big Laguna Lake, located approximately 5 miles north of the Project area. In addition, two 2008 records occur on the Mt. Laguna Quadrangle Quad approximately 5 miles west of the Action Area. There are no known occurrences of San Bernardino bluegrass within the Mt. Laguna parcel of the Action Area. Based on the habitat assessment, the species may have a low to moderate potential to occur within modeled habitat areas.

There is no designated Critical Habitat for San Bernardino bluegrass within the Action Area.

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3.3 Listed and Proposed Wildlife Species Potentially Affected

3.3.1 Quino Checkerspot Butterfly (*Euphydryas editha quino*)

Status: Federal Endangered

Background

The QCB, has a red, black, and cream colored checkered pattern on its wings with red strips across the abdomen. In 1997 the QCB was federally listed as endangered by the USFWS (USFWS 1997). A Critical Habitat designation and a Federal Recovery Plan were established in 2002 and 2003, respectively (USFWS 2002; USFWS 2003).

Life History

The QCB is not associated with one particular plant community. Rather, QCB are associated with a variety of plant communities including chaparral, coastal sage scrub, pinyon-juniper woodland, and oak woodland. Specifically, QCB habitat is openings or clearings within these habitats which contain viable populations of the species host plant, dwarf plantain (*Plantago erecta*), and hard clay or cryptogamic soils (Mattoni 1997). Like most butterflies, the QCB and its lifecycle are closely associated with its specific host plant on which the female butterflies oviposit eggs and the larvae feed (Glassberg 2001). As more research and protocol surveys are conducted on QCB other host plants are being identified including white snapdragon (*Antirrhinum coulterianum*), woolly plantain (*Plantago patagonica*), and thread-leaved bird's beak (*Cordylanthus rigidus*). Secondary host plants, or plants which are only associated with larvae feeding (not egg depositing) include purple owl's clover (*Castilleja exserta*) and other native *Plantago* species (USFWS 2003).

The QCB's lifecycle includes four distinct stages: egg, larvae, pupa, and adult. The most recognizable stage of this species, the adult butterfly, is typically limited to a 4 to 6 week flight period in the spring. The timing of the flight period is dependent upon weather conditions, but has been recorded beginning as early as late January and ending as late as early May (Emmel and Emmel 1973; USFWS 2003). Typically the average flight season is during March and April. Once hatched an adult QCB lives from 10 to 14 days,

however the flight season for the species lasts from 1 to 2 months because the adult butterflies do not emerge from the pupae stage at the same time (Faulkner and Klein 2006).

Adult female butterflies mate the first day of their emergence and proceed to lay one to two egg clusters (20 to 150 eggs) per day every day until death. Females prefer to oviposit their eggs in full sun within sparse vegetation and bare ground. Eggs are deposited at the base of the host plant and larvae hatch from these eggs after an incubation period ranging from 10 to 14 days. The larvae then proceed to feed on the host plant until host plants die-off and environmental conditions trigger a state of dormancy or diapause in the larvae (USFWS 2003).

Diapause typically occurs after the larvae grow to at least the second instar and more often the third or fourth instar. As host plants senesce and temperatures increase, QCB larvae lower their metabolic rate and "rest" until conditions are more ideal and host plants are more plentiful. Typically larvae remain in diapause until spring rains when the host plants are more plentiful. Larvae emerge from diapause to feed and then pupate when suitable conditions are present. Some observations indicate that QCB can reemerge from diapause, feed, and reenter diapause if environmental conditions are not favorable. Other observations indicate that if there is enough rainfall and host plant availability some larvae may not enter diapause and continue feeding and molting until pupation. In either situation, larvae continue feeding and molting generally until the sixth or seventh instar before pupating within silken shelters near ground level. After approximately 10 to 14 days in the pupa stage, the adult QCB emerge for the flight season (USFWS 2003).

Distribution, Abundance, Trends

Although the historic range of the QCB was once as far north as Ventura County and south of the Tehachapi Mountains, today it is estimated that more than 75 percent of the historic range of this species has been lost. Today the QCB can only be found in more isolated populations located in western Riverside County, southern San Diego County, and northern Baja California, Mexico (USFWS 2003).

Population levels can fluctuate dramatically with numbers dependent on the timing and amount of rain with respect to the availability of host plants. Abundance numbers differ greatly from year to year because larvae can remain in diapause until suitable conditions are present. Therefore, during a drought year abundance will be much less than during a wet spring because the larvae are spurred to emerge from diapause by environmental conditions (Faulkner and Klein 2006).

Threats and Limiting Factors

While habitat loss and fragmentation is the predominant limiting factor in the recovery of QCB, a number of factors threatening the QCB have been identified by the USFWS including invasion of existing habitat by nonnative plants, off-road vehicle activity, grazing, introduced invertebrates and parasites, fire regimes, enhanced soil nitrogen,

increases in atmospheric carbon dioxide concentration, and climate change (USFWS 2003).

Ensuring the protection of current populations and the connectivity and viability of current suitable habitat for metapopulations is essential to the recovery of this species.

Presence in the Action Area

According to historical sightings, historical range, presence of host plant, and suitable habitat within the Action Area, potential habitat for the QCB (Figure 9) exists in the Inland Valley South Link and the CNF South Link (TRC 2008). The route from MP 27 to MP 119 falls within the USFWS Year 2005 Recommended Survey Areas 1 and 2 (USFWS 2005).

According to the most recent version of the CDFG's CNDDB, QCB occurrences or sightings have been reported near Alpine, Dulzura, Jamul Mountain, Otay Mountain, Jacumba, and Tecate within the last five years. These sightings were all outside of the Action Area, but two of the reported sightings were within approximately 3 miles of the Action Area. Sightings were recorded just south of MP 97 and in the vicinity of MP 81 to 83 (CDFG 2008). Other sightings reported by biologists conducting fieldwork outside of the Action Area this year included sightings in Jacumba (USFWS 2008).

In 2007, protocol surveys were conducted for QCB within the Inland Valley South Link from MPs 114 to 119 (TRC 2007). No QCB were observed. During protocol surveys conducted in 2008, 11 QCB individuals were observed in the CNF South Link between MPs 75 and 82, and host plants were recorded between MPs 75 and 84. Additionally, QCB host plants were recorded by surveyors in the CNF South Link between MPs 34 and 39 and in the Inland Valley South Link near MPs 103 and 106 and between MPs 112 and 119. While all of these areas fall within the range of QCB habitat, many areas were excluded from surveys based on the absence of suitable habitat. Within the Action Area there are approximately 5,726 acres located in Survey Areas 1 and 2. To date, 407 of these acres have been excluded because QCB habitat is not present and approximately 1,015 acres have been surveyed and determined to be unoccupied. Approximately 4,304 acres of the route within QCB Survey Area 2 have yet to be surveyed due to changes in the route after the surveys had been completed, extreme terrain preventing access, and denied right of entry on some private and publicly owned parcels.

QCB Critical Habitat occurs in four miles of the Action Area between MPs 34 and 38. On January 17, 2008 the USFWS published a Proposed Rule to revise Critical Habitat Designations for the QCB. If adopted, the Proposed Rule would provide the same or slightly less Critical Habitat in the Action Area (USFWS 2008).

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3.3.2 **Laguna Mountains Skipper** (*Pyrgus ruralis lagunae*)

Status: Federal Endangered

Background

The Laguna Mountains Skipper (*Pyrgus ruralis lagunae*) (LMS), is a small brown butterfly with distinctive white-checked wing markings. A narrow endemic, it is considered a subspecies of the more widespread two-banded skipper (*Pyrgus ruralis*), because the LMS is separated by several hundred miles from the known range of the two-banded skipper. While the two species are similar in appearance, the LMS possesses a distinctive 'X' formed by the white markings on the forewings (Faulkner & Klein 2006). The USFWS listed the LMS as federally endangered in 1997. This species only occurs in the Laguna Mountains and Palomar Mountain in San Diego County (Black 2005).

Life History

The LMS is closely associated with its primary larval (caterpillar) host plant, Cleveland's horkelia (*Horkelia clevelandii*). Other larval host plants potentially utilized by this species include sticky cinquefoil (*Potentilla glandulosa*) and slender cinquefoil (*Potentilla gracilis*). LMS prefer high densities of their host plant located within a partially wet, montane meadow with a vegetation density of approximately 50 percent or less. Heavily vegetated montane meadows, especially with abundant introduced grasses, are not suitable habitat for this species. Adult LMS prefer meadows with open spots of bare ground and rocks for thermoregulation (Faulkner and Klein 2006).

There are two annual flight seasons for the LMS. The first generation emerges from late March to late May with the second generation appearing from late June to early August. After emerging from the pupa the first generation proceeds to mate, with females ovipositing eggs on the underside of the leaves of Cleveland's Horkelia or other suitable host plants. Eggs hatch in approximately 10 days and the larvae construct a protective shelter by sewing leaflets together, proceed to eat, grow, and molt for 20 to 40 days (depending on environmental conditions). The larvae pupate within the rolled leaf shelters for about four weeks before emerging as the adult skippers of the second generation. The second generation life cycle is similar to the first generation except for remaining in the pupal stage during the winter diapause (Faulkner and Klein 2006).

First and second generation adult skippers nectar on different plants depending on seasonal availability. Preferred nectar plants include goldfields (*Pentachaeta*), buttercups (*Ranunculus*), popcorn flower (*Cryptantha*), and checkerbloom (*Sidalcea*). As different flowers appear later in the year, second generation LMS tend to nectar on horkelia, mustard, and deerweed (*Lotus scoparius*) (Faulkner and Klein 2006).

Distribution, Abundance, Trends

Although this species was originally described from collections made in the Laguna Mountains and on Palomar Mountain, populations in the Laguna Mountains have not

been observed for over seven years. Repeated systematic surveys for LMS have been conducted in the Laguna Mountains at numerous locations from 2002 to 2007 by the USFS, and in 2008 by the USFWS. Additional surveys were also preformed on Palomar Mountain for the USFS at Mendenhall Meadows, the Observatory Campground, and at a site on the East Grade Road. LMS were found to occur in abundance at Mendenhall Meadows and sporadically at the Observatory Campground. In 2006, large numbers of adult LMS were observed in the French Creek area of Palomar Mountain and continued to be monitored by the USFWS in 2007 and 2008. In the 2005 Recovery Data from the USFWS in Carlsbad, the Service indicates that populations are declining (USFWS 2007). An attempt is currently being made in captive breeding of LMS with the hope of learning more about their biology and the possibility of future releases into other habitats.

Threats and Limiting Factors

The restricted range, localized distribution, and small population make this species vulnerable to the effects of habitat loss, grazing, fire, larval parasitism by wasps, illegal collection of specimens, and climate change. Although the primary larval host plant for this species is a "fire-follower" and increased population density can occur after such an event, fire has a direct impact on LMS mortality and can lead to an entire population being extirpated (Faulkner and Klein 2006). Any single event may have a significant, but often temporary impact on the overall population, but a combination of these factors could lead to extinction of the species.

Presence in the Action Area

In Section 9A, approximately 3 to 4 miles northwest of MP 53, 54, and 55 are lands proposed as critical habitat for LMS that were historically occupied (Figure 10). However, no LMS have been historically or recently observed in the vicinity of the proposed alignment for the ESSR. This route does not contain suitable habitat for LMS since there is no evidence of the required larval host plants. Cleveland's Horkelia, the primary host plant, is absent from any of the meadow areas that might be impacted by this project including access roads and construction staging areas. A site assessment was conducted in September 2008 along the route containing potential habitat (personal communication, D.K. Faulkner). The absence of larval host plants along the route would preclude LMS in the action area.

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3.3.3 **Arroyo Toad** (*Bufo californicus*)

Status: Federal Endangered

Background

The arroyo toad was federally listed as endangered on December 16, 1994 (USFWS 1994). On April 13, 2005 final Critical Habitat was designated for this species in Santa Barbara, Ventura, Los Angeles, San Bernardino, and Riverside Counties (USFWS 2005). A final Recovery Plan was issued by the USFWS on July 24, 1999 (USFWS 1999).

Description

The arroyo toad is a small toad (5-8 centimeters long snout-vent length), with light-olive green or gray to tan dorsum with dark spots and warty skin. A light-colored, V-shaped stripe crosses the head and eyelids and the parotoid gland is oval (Stebbins 1985). Arroyo toads are endemic to the coastal plains, mountains, and desert slopes of central and southern California. This speices is found in very restricted areas in southern California and northwestern Baja California, Mexico. This species has been reported from streams and drainages in Ventura, Los Angeles, Orange, Riverside, San Bernardino, San Diego, and southwest Imperial Counties (Campbell *et al*. 1996). Most of the remaining populations exist on private lands and areas owned or managed by the USFS (Sweet 1992; USFWS 1994).

Habitat

Arroyo toads are habitat specialists (Jennings and Hayes 1994). Habitat features used by this species include: (1) open streamside sand or gravel flats (canopy closure is rare along streams inhabited by arroyo toads because the channel is usually wide, and episodic flooding prevents the establishment of a riparian strip of tall trees, especially those bordering breeding pools); (2) the margins of old flood channels on low terraces, particularly on sand and in association with dense clumps of willows (*Salix* spp.) (arroyo toads make extensive use of canopy margins of willow clumps on sand and gravel flats during late spring and summer); (3) canopy margins of live oaks (*Quercus agrifolia*) or scrub oaks (*Q. berberidifolia*, *Q. dumosa*) on higher terraces, adjacent to the floodplain; (4) adjacent upland coastal sage scrub and chaparral habitats for wintering/hibernation (Sweet 1992). In general, arroyo toad breeding areas are restricted to riparian environments in the middle reaches of large (third order and higher) coastal streams

during their active period. Aquatic arroyo toad habitats are created and maintained by the hydraulic processes that result from the geographic position of the habitat within the drainage and the size of the upstream watershed (Campbell *et al*. 1996).

Life History

Arroyo toads usually breed in pools with an average depth of 30 centimeters or less at the time of egg deposition. These pools have large areas of their bottoms covered by sand or gravel deposits with a minimum of embedded silt. Depending on weather conditions, nightly emergence and surface activity appears to occur from late February to early July at the start of breeding season when males begin to call and females are foraging to prepare for egg production. The peak of male calling begins early to mid-April and extends through late May. The late breeding season and long periods of dependence on surface water of arroyo toad larvae (tadpoles) and juveniles restrict them from occurring in areas where riverbeds dry out by early summer. Arroyo toad breeding season for the San Diego area typically is from mid-March through early July, and depending on weather conditions, as early as February. Embryos usually hatch in 4 to 6 days, and the larval period for arroyo toads last about 65 to 85 days. After metamorphosis from June to August, the juveniles remain on the bordering sand bars until the pool no longer persists. Sexual matuary is reached in 1 to 2 years (USFWS 2000).

Distribution, Abundance, and Trends

Historically, this species occurred in elevations from sea level to about 2,440 meters (8,000 feet), and it currently ranges from 300 to 1,400 meters (1,000 to 4,600 feet). Although the arroyo toad occurs principally along coastal drainages, it also has been recorded at several locations on the desert slopes of the Transverse and Peninsular Mountain ranges south of the Santa Clara River, Los Angeles County (USFWS 1999a). This species is now thought to be restricted to the Transverse and Peninsular Ranges. Most populations of this species occur on public lands, including Los Padres, San Bernardino, Angeles, and Cleveland National Forests (USFWS 1999). In San Diego County, arroyo toads have been found on the Santa Margarita, Guejito, Sweetwater, Vallecito, San Luis Rey, Santa Ysabel, Witch, Cottonwood, Temescal, Agua Caliente, Santa Maria, Lusardi, Pine Valley, Noble, Kitchen, Long Potrero, Upper San Diego, San Juan, San Vincente, and Morena drainages (USFWS 1999). This species is known from Kitchen Creek, La Posta Creek, Potrero Creek, Pine Valley Creek, Peterson Creek, Sweetwater River, and Cedar Creek on USFS lands (CDFG CNDDB 2007).

Threats and Limiting Factors

Because the arroyo toad is such a breeding habitat specialist, it is apparently highly susceptible to a diversity of processes affecting stream and riparian habitats. These processes, both natural (droughts, fires, and floods) and human-induced, include the following (USFWS 1999):

1) Periodic natural and human-made flooding (usually the untimely release of water from upstream dams) resulting in scouring and siltation of arroyo toad breeding sites (Sweet 1992; Sweet 1993).

2) Habitat depletion and alteration as a result of the construction and operation of dams, bridges, and culverts in aquatic arroyo toad habitats in addition to urban and agricultural development in upland (winter/hibernation) habitats (USFWS 1999).

3) The predation of arroyo toads, their eggs, and larvae by introduced exotic predators (especially bullfrogs [*Rana catesbeiana*] and their voracious larvae, non-native fishes, and crayfish) as well as native predators (wading birds, garter snakes, raccoons, etc.) (Sweet 1993).

Little is known currently about arroyo toad overwintering habitats and threats to adult toads during the non-breeding season (USFWS 1999 and 2000). However, adult toads may range widely into surrounding upland habitats which include alluvial scrub, coastal sage scrub, chaparral, and oak woodlands. Substantial areas of fine sand, into which adults toads burrow, must be present, but can be interspersed with gravel or cobble deposits. Adult toads commonly disperse up to 0.5 kilometer and as much as 1.3 kilometers from a breeding stream (USFWS 1999). In San Diego, adult toads are regularly found within 0.5 kilometer and up to 0.8 kilometer perpendicularly from appropriate breeding habitat along streams (USFWS 1999, 1999a, and 2000). However, most toads are found within 50 meters of the active channel (Ramirez 2002).

Presence in the Action Area

Arroyo toads are known to occur in San Diego County and have the potential to occur within the Action Area (Figure 8) in the Inland Valley South Link and CNF South Link (MPs 53.2 to 75.7 and MPs 91 to 100) (CDFG CNDDB 2007). Thus, the species has the potential to occur within the CNF South Link as well as on private lands in the Action Area.

The USFS provided a GIS database showing occupied habitat and suitable (modeled) habitat for the arroyo toad within the CNF. The USFS GIS information was used in concert with field habitat assessments to determine the potential presence of arroyo toads in the portions of the Action Area that are within the CNF South Link. Results from the data indicate that potential arroyo toad habitat occurs within streams that the project route crosses within the CNF South Link. Arroyo toad habitat assessments conducted in Spring 2007 by HELIX Environmental for all of these stream crossings identified 16 drainages within the CNF that had suitable conditions or habitat quality sufficient to warrant focused surveys (from MP 53.2 to MP 103.4). Figure 8 shows the location of the proposed alignment and the occupied and suitable habitat. Focused surveys were conducted for the 16 identified drainages in 2007, following USFWS protocol where possible. According to USFWS policy, all areas within 1 kilometer of an observed arroyo toad are considered occupied habitat (USFWS 1999).

As a result of the focused surveys, presence of arroyo toads was assumed for the following areas:

- Protocol arroyo toad surveys conducted at the Sweetwater River site (occupied habitat) were negative. Habitat at that site was highly suitable, with slow-moving pools, sandy benches, and open riparian vegetation. Moreover, the California Natural Diversity Database (CDFG CNDDB 2007) has a 2001 arroyo toad observation north of the intersection of Highway 79 and Riverside Drive less than 1 kilometer northeast of the site. The arroyo toad is assumed present at this site despite the negative protocol surveys.
- Because the El Capitan Reservoir was closed at nighttime, arroyo toad surveys at the San Diego River site were not conducted to protocol, and the arroyo toad is therefore assumed present. Surveys at the San Diego River were completed by listening for calls from El Monte Road.
- Arroyo toad presence was assumed at the La Posta Creek, Kitchen Creek, Sweetwater River, and San Diego River locations. The site where the alignment crosses La Posta Creek is on a private in-holding within the CNF and surveys were not conducted because permission was not received from the landowner. Because surveys were not conducted to protocol, presence is assumed for this creek.
- Arroyo toads have been recorded in Long Potrero Creek in 1993 (CDFG 2007). This creek crossing was not surveyed in 2007 because it was dry at the time of the arroyo toad habitat assessment, but it is considered occupied habitat because of the recorded observation within 1 kilometer of the crossing.
- Wilson and Taylor Creeks.
- Although it was dry, Horse Canyon contains otherwise suitable arroyo toad habitat and it was therefore assumed to be occupied by arroyo toads.
- Protocol surveys at the Pine Valley Creek site were negative although the CNDDB has 1991 records from within 1 kilometer of the site. The habitat at the survey area is marginally suitable, with an open willow canopy and sandy substrate, but the site is disturbed by ongoing cattle grazing. Grassy groundcover is high in this area, and crayfish, a very effective predator on arroyo toad eggs, tadpoles, and metamorphs, were noted during each site visit. Regardless of the age of the arroyo toad observations along Pine Valley Creek, the high level of disturbance, and the negative 2007 protocol surveys, this site is still considered occupied by the arroyo toad because the USFS GIS database indicates it is occupied habitat.

There is no arroyo toad Critical Habitat in the Action Area.

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3.3.4 **Southwestern Willow Flycatcher** (*Empidonax traillii extimus*)

Status: Federal Endangered; State Endangered

Background

The southwestern willow flycatcher (*Empidonax traillii extimus*) is one of four subspecies of the willow flycatcher (*Empidonax traillii*) (Unitt 2004). The four willow flycatcher subspecies occupy four distinct breeding ranges within the United States and are differentiated by small differences in color and morphology (Sogge *et al*. 1997). The southwestern willow flycatcher breeds in dense riparian habitats in southwestern United States, including San Diego County, and possibly portions of northern Baja California, Mexico and winters in southern Mexico, Central America, and northern South America (Sogge *et al*. 1997; Unitt 2004; USFWS 2002).

The southwestern willow flycatcher is one of the rarest birds in southern California (Unitt 2004). According to the San Diego County Bird Atlas (Unitt 2004) there are fewer than 90 breeding pairs in San Diego County out of approximately 200 or less pairs in California. Because of the increasing rarity of this bird and continued loss of and threats to its habitat, the southwestern willow flycatcher was federally listed as endangered in March 1995 (USFWS 1995), and a recovery plan was published in 2002 (USFWS 2002). Critical Habitat was designated for the subspecies in November 2005 (USFWS 2005).

Life History

Willow flycatchers are relatively small flycatchers with a whitish neck that contrasts with a diffuse olive to brownish breast band and back, whitish-gray wing bars, and an indistinct whitish eye-ring (Sedgwick 2000). The southwestern willow flycatcher is generally paler than and differs primarily in wing morphology from the other willow flycatcher subspecies; however, it is difficult to distinguish southwestern willow flycatcher from the other subspecies in the field based on these characteristics (Sogge *et al*. 1997; Unitt 2004). The southwestern willow flycatcher also differs vocally from the other subspecies, with its characteristic willow flycatcher "fitz-bew" song or vocalization slower than the other subspecies' (Sedgewick 2000; Unitt 2004).

Willow flycatchers, including the southwestern willow flycatcher subspecies, are primarily insectivorous, although they will eat some vegetable matter, primarily berries (Sedgwick 2000). In typical flycatcher fashion, they forage on insects by hawking and hover gleaning. Studies have found that 96 percent of the diet is made up of insect prey (Sedgwick 2000).

Willow flycatchers, including the southwestern willow flycatcher subspecies, prefer dense riparian associations of willow, cottonwood, and other deciduous trees and shrubs (Sedgwick 2000). In the west, willow flycatcher shows an affinity for moist or wet shrubby habitats. In California and the desert southwest, this species is restricted to willow thickets along streams in broad valleys, in canyon bottoms, around mountain seepages, or at the margins of ponds and lakes (Grinnell and Miller 1944). Occupied

nesting sites are commonly associated with slow moving water, such as river backwaters, abandoned channels or oxbows, and the edges of impounded waters (USFWS 2002).

Adult willow flycatchers exhibit high breeding site fidelity. In southern California, 61 percent of adult males and 51 percent of adult females returned to a study area in subsequent years (Sedgwick 2000). Willow flycatchers establish monogamous pair bonds, although polygyny has been reported. In polygynous pairs, the male typically divides his time between females and may provide parental care at one or both nests (Sedgwick 2000). Pair bonds appear to be maintained for multiple years (Sedgwick 2000). Territorial disputes among males are frequent during pre-nesting and intruding males may occasionally be attacked by both members of a territorial pair (King 1955). Nests are placed low in forks in the outer edges of bushes or small trees, typically near water (Sedgwick 2000). Nest sites typically have high foliage volume, presumably for microclimate regulation and protection from predators. Nests are made up of a combination of fine and coarse plant materials, neatly woven together. Willow flycatcher clutches average three to four eggs and the female incubates the clutch for approximately 14 days. Typically, there is only one brood per season occurring between mid-May to July. However, willow flycatchers will persistently re-nest after nest failure. Nestlings are altricial at hatch and remain in the nest for two weeks before fledging (Baicich and Harrison 1997; Sedgewick 2000).

Distribution, Abundance, and Trends

Of the three willow flycatcher subspecies that occur in California, only the southwestern willow flycatcher has the potential to breed in the Action Area (Sedgewich 2000; Unitt 2004). The range of the southwestern willow flycatcher is southern California, Arizona, New Mexico west of the Rio Grande, southwestern Utah, southern Nevada, and possibly southwestern Colorado (Sedgwick 2000). Historically within California, the southwestern willow flycatcher was a common breeder from the Santa Ynez River in western Santa Barbara County southward into Riverside and San Diego Counties. Current breeding locations are restricted locally to southern Kern, Santa Barbara, Riverside, and San Diego counties (USFWS 2002). Breeding bird survey data indicate that willow flycatchers in the western U. S. declined by 3.0 percent per year during the 1966 to 1979 survey period, although these declines slowed to 1.2 percent per year between 1980 and 2005 (Sauer *et al*. 2005). Within California, decreasing trends from 1966 to 1979 (-1.7 percent per year) have become increasing trends between 1980 and 2005 (+5.4 percent per year) (Sauer *et al*. 2005). Southwestern willow flycatcher populations are reduced from historical levels, but there is no evidence of more recent declines since its listing as an Endangered species in 1995 (USFWS 1995; Sedgwick 2000). The total number of southwestern willow flycatchers is probably less than 1,000, with the largest single population along the Gila River in southwestern New Mexico (Sedgwick 2000). All other known populations consist of less than 40 pairs. Less than 90 pairs of southwestern willow flycatcher breed in California (Small 1994; Unitt 2004). Population status of southwestern willow flycatcher is critical as most populations (about 75 percent) are small (<5 individuals) and widely separated from other breeding groups (USFWS 1995).

Threats and Limiting Factors

Overall, the willow flycatcher is primarily threatened by loss, fragmentation, modification, and degradation of their riparian breeding habitats (Sogge *et al*. 1997; Sedgewick 2000). These impacts to their riparian breeding habitat are a result of: urbanization and recreational development; cattle grazing and agricultural development; water diversion, impoundment, and channelization; and introduction of invasive, nonnative plant species (Sogge *et al*. 1997; USFWS 2002). Another significant and widespread threat to the southwestern willow flycatcher is excessive brood parasitism by the brown-headed cowbird (*Molothrus ater*) (Sogge *et al*. 1997; Sedgewick 2000). The increase in brood-parasitism is caused by fragmentation and reduction of riparian habitat patches that can then be more readily invaded by the brown-headed cowbird. Cowbird parasitism can have severe deleterious effects on breeding productivity. Sedgwick and Iko (1999) found that nest success of parasitized pairs was 50 percent less than that of unparasitized pairs. Habitat alteration and brood parasitism by brown-headed cowbirds may present the largest conservation problem for southwestern willow flycatcher, as this subspecies is heavily parasitized in California and Arizona (Harris *et al*. 1987; Whitfield and Sogge 1999). Conservation measures have been implemented in an effort to improve reproductive success across the range of southwestern willow flycatcher. Cowbird control (trapping, addling eggs, removing nestlings, and/or shooting) has been used as a management tool for several populations of southwestern willow flycatcher, mostly in California (Winter and McKelvey 1999). These measures appear to be working in southern California, as flycatcher nest success and young fledged/female increased from 23 percent and 1.04 young/female before cowbird trapping to 39 percent and 1.74 young/female after cowbird trapping; however, their was little evidence of an increase in adult breeding pairs in the study area (Sedgwick 2000). Cowbird-management programs may be needed to increase flycatcher reproductive success in the short term, but ultimately, the survival of southwestern willow flycatcher will depend on maintenance and restoration of riparian habitats (Sedgwick 2000).

Presence in the Action Area

In San Diego County, breeding southwestern willow flycatchers are now somewhat restricted to two modest colonies and a few smaller colonies and scattered pairs, with the largest two colonies found along the upper San Luis Rey River and along the Santa Margarita River on Camp Pendleton (Unitt 2004). Neither of these two breeding colonies is near the Action Area. The upper San Luis Rey River is approximately 25 miles north of the western most section of the Action Area and the Santa Margarita River system is north of the San Luis Rey River.

In 2007, HELIX Environmental Planning, Inc. conducted southwestern willow flycatcher surveys for the then described Alternatives Portion of the Sunrise Powerlink Project (HELIX 2008). Because of access issues, treacherous site conditions, and changes to the route after the surveys had been completed, not all areas with suitable habitat were surveyed (HELIX 2008). Additionally, not all of the Alternative Portions of the project surveyed in 2007 are currently part of the Action Area. In the Action Area, HELIX

surveyed habitat suitable for southwestern willow flycatcher in the Inland Valley South Link and in the CNF South Link (Figure 12). No southwestern willow flycatcher was observed in the Action Area.

A search of CDFG's CNDDB within three miles of the Action Area found no documented southwestern willow flycatchers (CDFG 2008). When the project route is overlaid with the San Diego County Bird Atlas, the project route was found to fall in or near six cells where southwestern willow flycatcher was found (Unitt 2004). Five of these six willow flycatcher observations were presumed migrants and occurred within the CNF South Link (Unitt 2004). The sixth observation is described as breeding (two territories) and occurred in 2001 along the San Diego River at the upper end of El Capitan Reservoir (Unitt 2004).

The Action Area also falls within USFS lands. Portions of these lands have been designated by the Forest Service as occupied territory for southwestern willow flycatcher (USDA 2005). To estimate potential habitat in the Action Area, Helix's 2007 protocol survey locations and point data were analyzed in conjunction with the USFS modeled habitat data. The two data sets, which were within the Inland Valley South Link and the CNF South Link contain locations of potential southwestern willow flycatcher habitat. Within these sections of the Action Area, there is approximately 155 acres of potential southwestern willow flycatcher habitat and approximately 145 of those acres are within the USFS Modeled Habitat areas.

The Action Area does not fall within and is not near any of the areas designated as Critical Habitat for this species (USFWS 2005).

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3.3.5 Coastal California Gnatcatcher (*Polioptila californica californica*)

Status: Federal Threatened; State Species of Special Concern

Background

The California gnatcatcher is a small, nonmigratory, insectivorous bird endemic to southern California coastal sage scrub habitat at elevations below 2,000 feet (700 meters) in coastal southern California down through Baja California, Mexico (Atwood and Bontrager 2001). California gnatcatchers can also occur in other habitats adjacent to or associated with coastal sage scrub, including grassland, chaparral, and riparian habitats (Bontrager 1991; Atwood and Bontrager 2001). Three subspecies of California gnatcatcher are recognized; the coastal California gnatcatcher (*Polioptila californica californica*) is found in southern California from southern Ventura County, south into northwest Baja California. The remaining subspecies are found further south in Baja California (Atwood and Bolsinger 1992; Atwood and Bontrager 2001).

Because the coastal California gnatcatcher can be commonly found in arid scrub habitats throughout coastal southern California, is has been heavily impacted by the rapid and wide-spread human population growth and suburban sprawl that has occurred in the area in the last 50 years (Atwood and Bontrager 2001). As a result of human growth and development in southern California, the coastal California gnatcatcher's habitat has been greatly reduced and fragmented. In response to habitat loss, the coastal California gnatcatcher was listed as Federally Threatened under the Endangered Species Act in 1993 (USFWS 1993). Critical Habitat was designated for this species in October 2000 (USFWS 2000) and revised by the USFWS in December 2007 (USFWS 2007).

Life History

California gnatcatchers are very small gray songbirds with a long, mostly black tail. The males are generally grayer in color than the females with a brownish tinge on the wings and back. The female's plumage is more obviously brown over all. Both sexes have a white eye-ring. In addition, the males develop a distinctive black cap during the breeding season (USFWS 2003; Atwood and Bontrager 2001). In keeping with its name, the California gnatcatcher eats small insects. They are foliage-gleaners primarily eating small arthropods, especially spiders, leafhoppers, beetles, and true bugs (Burger *et al*. 1999; USFWS 2003).

California gnatcatchers are year round residents in their scrub habitats in southern California. They begin forming pair bonds and establishing territories by late October and become territorial between late February and early March, with males becoming more vocal during this period (Mock *et al*. 1990; Preston *et al*. 1998). The breeding season extends from late February through July, with peak nest initiations occurring from

mid-March through mid-May (Atwood and Bontrager 2001). The size of a pair's breeding territory can vary, but is correlated with the distance to the coast, with the smallest territory size of 1 hectare along the coast to over 9 hectares further inland. During the winter, a pair's home range can expand to approximately 80 percent larger than its breeding territory (Unitt and Mock 2004).

Although breeding territories can occur in non-sage scrub habitats (Campbell *et al*. 1998), these habitats are typically used during non-breeding season, when territories are typically larger (Rotenberry and Scott 1998). Total shrub cover is an important factor in determining habitat suitability for California gnatcatchers (Stephenson and Calcarone 1999). They are most abundant in mature sage scrub stands, where perennial woody canopy cover is typically greater than 40 to 50 percent and often exceeds 60 percent (Atwood 1993). Large patches (>20 ha) are more likely to support breeding California gnatcatchers (Atwood *et al*. 1998).

California gnatcatchers generally form permanent pair bonds (Atwood and Bontrager 2001). The nest is a small, cup-shaped basket usually found 0.3 to 1.0 meter (1 to 3 feet) above the ground in a small shrub (USFWS 2001). The average clutch size is four eggs with a range of 2 to 5 eggs (Atwood and Bontrager 2001). Females lay eggs at one per day intervals (Sockman 1997) and incubate the clutch for approximately 14 days (Grishaver *et al*. 1998). Nest site attendance by male California gnatcatchers is equal to that of females for the first nest attempt, and declines to one-third of females' attendance in subsequent nesting attempts (Sockman 1998). Young fledge approximately 10 to 15 days after hatching (Grishaver *et al*. 1998). Juvenile birds associate with their parents for several weeks (sometimes months) after fledging (Atwood 1990).

Natal dispersal is an important demographic parameter, particularly for a non-migratory species such as the California gnatcatcher (Galvin 1998). Fledgling dispersal occurs between late May and November (USFWS 2001), typically within 80 and 100 days after fledging (Atwood and Bontrager 2001). Most juvenile California gnatcatchers disperse less than two kilometers (1.2 miles) from the natal territory (Atwood and Bontrager 2001). Adult California gnatcatchers rarely disperse once they have formed pair bonds and established territories (Atwood and Bontrager 2001).

Distribution, Abundance, and Trends

California gnatcatchers occur in southern California primarily on coastal slopes. They range from southern Ventura County southward through Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties and into northwestern Baja California (Atwood and Bontrager 2001). Historically the California gnatcatcher was considered locally more common as late as the 1940, but by the 1960's a significant population decline was being recognized (USFWS 2003). At the time of it's listing as a Threatened species it was estimated that approximately 2,562 pairs of California gnatcatchers remained in the United States; of these, 30 pairs occurred in Los Angeles County, 757 pairs occurred in Orange County, 261 pairs occurred in Riverside County, and 1,514 pairs occurred in San Diego County (USFWS 1993). More recently it has been estimated that fewer than 5,000

pairs exists in southern California (Atwood and Bontrager 2001). Recent studies have shown that California gnatcatcher populations can fluctuate widely based on annual rain fall and climate conditions; however, continued loss of habitat has the greatest affect on restricting its population numbers (USFWS 2003).

Threats and Limiting Factors

Remaining populations of California gnatcatchers are highly fragmented by urban development, which has destroyed coastal sage scrub habitat. Intense housing development and construction or expansion of transportation corridors in Orange, Riverside, and San Diego counties continue to threaten remaining large tracts of habitat (Small 1994). Coastal sage scrub is considered one of the most depleted habitat types in the United States (O'Leary 1990). Since the listing of this species, the amount of coastal sage scrub available to California gnatcatchers has continued to decrease (USFWS 2001). Up to 90 percent of coastal sage scrub has been lost due to development and land conversion (Westman 1981). Agricultural uses (e.g., grazing and row crops), urbanization, increases in fire frequency, and introduction of invasive nonnative plants have all adversely affected sage scrub habitat (USFWS 2001).

Regional wildfires also impact California gnatcatcher populations. A significant number of California gnatcatchers (as many as 200 pairs) were lost in the October 1993 wildfires (Small 1994). It is yet unknown what the impacts are from the 2003 and 2007 wildfires. Predation has a large role in limiting population growth, since it is the most common cause of California gnatcatcher nest failure (Unitt and Mock 2004). The gnatcatcher is also threatened by and susceptible to brown-headed cowbird (*Molothrus ater*) nest parasitism resulting from the increased habitat fragmentation (Atwood 1992). Braden *et al*. (1997) reported a nest parasitism rate of 32 percent in Riverside County where cowbird trapping and removal had not occurred. Only 2 percent of California gnatcatcher eggs hatched in nests that had been parasitized (Braden *et al*. 1997).

Conservation of remaining coastal sage is important for maintaining California gnatcatchers. Other conservation measures include the continued study of gnatcatcher distribution throughout southern California, establish regional conservation planning to maintain California gnatcatcher population viability, and increase fire prevention and control in coastal sage scrub habitat (Atwood and Bontrager 2001; USFWS 2001).

Presence in the Action Area

In San Diego County, the coastal California gnatcatcher can be widely found in coastal lowlands in dense California sage brush, but can also be found in other scrub habitat and grassland near or associated with California sage scrub (Unitt and Mock 2004). Elevation is an important limiting factor. In San Diego County, 90 percent of known California gnatcatcher locations occur at elevations below 1,000 feet (Unit and Mock 2004).

Information on the presence of the coastal California gnatcatcher in the Action Area was obtained from surveys conducted by HELIX Environmental Planning, Inc. in 2007 for the

then described Alternatives Portion of the Sunrise Powerlink Project (HELIX 2008), from a review of the San Diego County Bird Atlas and a search of CDFG's CNDDB, and from modeled habitat from the USFS in the CNF. Based on this available information, habitat for coastal California gnatcatchers exists in the Inland Valley South Link and the CNF South Link between MPs 71 and 120 (Figure 13).

In the Action Area, HELIX surveyed habitat suitable for coastal California gnatcatcher in the Inland Valley South Link and in the CNF South Link. Not all of the Action Area was reviewed, however, due to changes in the route after the surveys had been completed, extreme terrain preventing access, and denied right of entry on some private and publicly owned parcels. No coastal California gnatcatchers were observed in the portion of the Action Area that was surveyed, but two of the survey areas (between MPs 106 and 109) were identified by HELIX as "Assumed Present" for coastal California gnatcatcher (HELIX 2008).

Arcadis surveyed suitable habitat within the Action Area in 2007 for the portion of the Proposed Project west of Highway 67 and along the Sycamore-Elliot Reconductor 69 kV line. Two pairs of coastal California gnatcatchers were found at the southern end of the Sycamore-Elliot Reconductor 69 kV line.

According to both CDFG's CNDDB (CDFG 2008) and the San Diego Bird Atlas (Unitt 2004), California gnatcatchers have been documented in several locations within the Action Area. These locations are all within the western portions of the route from MP 111 to 119. There are two sightings located outside of the Action Area south of MP 76 and 79 and west of Potrero.

Surveys have not been conducted for a majority of the Action Area, but will be prior to construction. For now, the entire Action Area from MP 71 to 120 is assumed to be potential coastal California gnatcatcher habitat. Within these sections of the Action Area, there are approximately 49 miles of right-of-way that could contain potential coastal California gnatcatcher habitat.

The project route falls within and is near designated Critical Habitat for the coastal California gnatcatcher. A portion of the project route within the Inland Valley Link, from approximately Mileposts 101.5 to 103.5, falls within Critical Habitat Unit 2 (USFWS, 2007).

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3.3.6 **Least Bell's Vireo** (*Vireo bellii pusillus*)

Status: Federal Endangered; State Endangered

Background

The least Bell's vireo (*Vireo bellii pusillus*) is a small neotropical migrant that breeds in southern California and northern Mexico and winters in central and southern Mexico (Brown 1993). It is an obligate, low-elevation (< 610 m), riparian subspecies inhabiting dense, willow-dominated riparian habitats with lush understory vegetation in the immediate vicinity of small streams and rivers. Since least Bell's vireo are dependent on riparian areas in southern California for breeding, human impacts such as loss of habitat and modification of and use of stream and river systems, in addition to increase nest parasitism, lead to a decrease in this subspecies' population. Consequently the least Bell's vireo was federally listed as endangered by the USFWS in May 1986 (USFWS 1986). Critical Habitat was designated for this subspecies in February 1994 (USFWS 1994) and a recovery plan was published in 1998 (USFWS 1998).

Life History

The least Bell's vireo is a small, gray vireo with pale wing bars and a faint white eye ring (Brown 1993). Least Bell's vireos primarily eat insects and spiders (Chapin 1925), often foraging on willows within riparian habitat. They also exhibit strong territoriality protecting nesting sites and food resources (Brown 1993). Males aggressively defend territories from neighboring birds by intensive singing or physical contact (Barlow 1962). Least Bell's vireo territory sizes vary considerably, and probably depend on habitat extent and quality, population density, and nesting stage. In California, reported territory sizes of least Bell's vireos were 0.2 to 1.6 hectare (0.5 to 4.0 acre) (Gray and Greaves 1984).

Least Bell's vireos nest primarily in willows but also use a variety of shrubs, trees, and vines (USFWS 1986). According to the USFWS (2001), the habitat elements essential for conservation of this species can be described as riparian woodland vegetation that generally contains both canopy and shrub layers. Nests are generally located in the fork of a forb, shrub, or tree within 1 meter (3 feet) of the ground. These areas generally have an open midstory with an overstory consisting of willows (*Salix* spp.), cottonwoods (*Populus* spp.), sycamores (*Platanus* spp.) or oaks (*Quercus* spp.) (Brown 1993). Significant overstory species include mature arroyo willow (*S. lasiolepis*) and black willows (*S. goodingii*) (Brown 1993).

Males typically return from the wintering grounds before females and begin establishing territories by late March. Female least Bell's vireos settle on male territories within two days of their arrival on the breeding grounds, and courtship begins immediately. Courtship probably lasts one to two days before nest construction begins (Barlow 1962). In California, egg laying usually begins in April and lasts four to five days. Females lay between three and five eggs per clutch (Brown 1993). Incubation begins once the first egg is laid, and typically lasts 14 days. Both sexes brood and feed the young, although females may brood more than males (Nolan 1960; Brown 1993). Young typically fledge 10 to 12 days after hatching. Most pairs in California produce one or two broods per season; however, up to four broods per season are occasionally produced (Franzreb 1989). When second broods are produced, a new nest is constructed immediately after the first brood has fledged or failed (Brown 1993).

Least Bell's vireos exhibit a high degree of natal and breeding site fidelity. In a California study between 15 to 20 percent of banded fledglings returned to the same site to breed the following year (Brown 1993). Given the probable high rate of post-fledging mortality, these results suggest that most fledglings that survive the winter and migration return to breed at their natal site (Brown 1993). Adult least Bell's vireos also exhibit strong breeding site fidelity, and nest sites are sometimes located within 1 meter (3.3 feet) of the previous year's nest (Brown 1993).

Distribution, Abundance, and Trends

Least Bell's vireo is one of four recognized subspecies of Bell's vireo (*Vireo bellii*), all of which are found breeding in some portion of the southwestern United States and northern Mexico (Brown 1993). Least Bell's vireo was historically widespread in riparian

woodlands of the Central Valley and low elevation river valleys of California. Grinnell and Miller (1944) considered it one of the most abundant birds in California. Populations in Owens Valley, Death Valley, Sacramento and San Joaquin Valleys, the Sierra Nevada foothills, and Tehama County have been extirpated (USFWS 1998). Historically, the least Bell's vireo was abundant in California. However, loss of riparian habitat combined with brown-headed cowbird (*Molothrus ater*) nest parasitism in the latter half of the 20th century led to a dramatic declined in the least Bell's vireo numbers to about 300 pairs by the early 1980s, with about half of those pair in San Diego County (Unitt 2004a). Since their federal listing the population in the United States has increased 10-fold, with the greatest increase in San Diego and Riverside Counties (USFWS 2006). Least Bell's vireo populations in San Diego County increased from an estimated 223 territories between the years 1997 to 1985 to an estimated 1609 territories between the years 2001 and 2005 (USFWS 2006). Currently, it is estimated that approximately 54 percent of the least Bell's vireo population can be found in San Diego County (USFWS 2006). The majority of the least Bell's vireos in San Diego County are found in the northern part of the county, along the Santa Margarita River on Camp Pendleton, along the San Luis Rey River and a couple of it's tributaries (Windmill and Pilgrim creeks) (Unitt 2004a). Despite increases in population size since 1986, the least Bell's vireo still occupies a very small fraction of its former range (USFWS 2001). The species' breeding distribution is currently restricted to Kern, San Diego, San Bernardino, Riverside, Ventura, Los Angeles, Santa Barbara, and Imperial Counties. Breeding populations are concentrated in San Diego, Santa Barbara, and Riverside Counties (USDA 2000).

Threats and Limiting Factors

Habitat degradation and nest parasitism by brown-headed cowbirds have been identified as the biggest threats to least Bell's vireo populations in southern California (USFWS 1998). Over 95 percent of historic riparian habitat has been lost throughout the central valley of California. At one time, this region may have accounted for 60 to 80 percent of least Bell's vireo populations in California (USFWS 1986). Similar habitat losses have occurred throughout the remaining strongholds in southern California (USFWS 1986), further endangering this species.

Least Bell's vireos are negatively impacted by brown-headed cowbirds brood parasitism. Where it has not been effectively reduced through control programs, brood parasitism probably is the most chronic and limiting threat to least Bell's vireo populations after habitat loss (Stephenson and Calcarone 1999). Activities that result in habitat fragmentation (e.g., urbanization) can cause a loss of habitat and create an increased habitat edge that is favored by brown-headed cowbirds and certain nest predators (Joslin and Youmans 1999). Several conservation measures have been outlined for the continued protection of least Bell's vireos and their riparian habitats. The most critical measures include protecting riparian habitat from degradation resulting from overgrazing, recreational use, channelization, and development, and controlling cowbirds to reduce parasitism.

Presence in the Action Area

Information on the presence of the least Bell's vireo in the Action Area was obtained from surveys conducted by HELIX Environmental Planning, Inc. in 2007 for the then described Alternatives Portion of the Sunrise Powerlink Project (HELIX 2008). Because of access issues, treacherous site conditions, and changes to the route after the surveys were conducted, not all areas with suitable habitat were surveyed (HELIX 2008). Additionally, not all of the Alternative Portions of the project surveyed in 2007 are currently part of the Action Area. Of the 38 areas identified as surveyed by HELIX (2008), least Bell's vireo was found at six of these areas, only two of which are still part of the Action Area. In the Action Area, HELIX surveyed habitat suitable for least Bell's vireo in the Inland Valley South Link and in the CNF South Link. In two of the survey areas, least Bell's vireo was observed along Cottonwood Creek (HELIX 2008). One of the survey areas was identified as Assumed Present for least Bell's vireo (HELIX 2008).

Helix's 2007 protocol survey locations and point data were analyzed in conjunction with the USFS modeled habitat data (Figure14). The two data sets, which were within the Inland Valley South Link and the CNF South Link noted locations of potential least Bell's vireo habitat. Within these sections of the Action Area, there are approximately 83 acres of potential least Bell's vireo habitat, 72 of which are within the USFS Modeled Habitat areas.

A search of the CDFG's CNDDB within three miles of the Action Area found 13 separate occurrences for least Bell's vireo (CDFG 2008). These occurrences are all outside of the Action Area, but are within approximately 3 miles of the Action Area within the Inland Valley South Link and the CNF South Link. An isolated least Bell's vireo occurrence surrounded by development is over 2 miles north of MP 120 (Sycamore Canyon Substation). Least Bell's vireos have been documented along the San Diego River within 3 miles of MP 109. Least Bell's vireo has been documented east of Harbison Canyon approximately 3 miles from MP 99. Approximately 2 miles northwest of MP 88, vireos have been observed on the Sweetwater River above Palo Verde Lake. Least Bell's vireo was also observed approximately 3 miles east of MP 84 in Pine Valley Creek area above Barrett Lake. The CNDDB documents least Bell's vireo along several portions of Cottonwood Creek, where it roughly parallels the Action Area. Along this section of Cottonwood Creek, the occurrences are located approximately 3 miles north of MPs 75 and 76 and approximately 1 to 2.5 miles north of MP 70 through 72. The last least Bell's vireo occurrence documented by the CNDDB near the Action Area is approximately 3 miles south of MP 66 in the Camp Creek area southwest of Cameron Corners.

Based on a review of the San Diego County Bird Atlas (Unitt 2004b), the Action Area was found to be near nineteen cells where least Bell's vireo was found (Unitt 2004b). Most of these documented sightings are in the same general area and are near the same project route Sections as documented by the CDFG CNDDB (CDFG 2008; Unitt 2004b). The Atlas documents least Bell's vireo approximately 3 miles south of MP 120 (Sycamore Canyon Substation) in the West Sycamore/ Sycamore Creek system in the

Santee area. The atlas documents least Bell's vireo along the San Diego River approximately 1 mile south of MP 106 and on the San Diego River above El Capitan Reservoir approximately 3 miles northeast of MP 103. Vireos are documented south of the project route and MP 78 in Cottonwood Creek south of Barrett Lake and north of Barrett Junction. Finally, the atlas has least Bell's vireo approximately 3 miles east of MPs 45 and 46 in Jim Canyon in the Jacumba area (Unitt 2004b).

The Action Area does not fall within and is not near any of the areas designated as Critical Habitat for this species (USFWS 1994).

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3.3.7 Stephen's Kangaroo Rat (*Dipodomys stephensi*)

Status: Federal Endangered

Background

The Stephens' kangaroo rat (SKR) was listed as threatened under the California Endangered Act (CESA) in 1971 and federally listed as endangered on September 30, 1988 (USFWS 1988). A draft Recovery Plan was issued by the USFWS in April 1997 (USFWS 1997). As of 2008, a final Recovery Plan has yet to be completed for this species. No Critical Habitat has been designated for this species.

Description

SKR is a medium-sized member of the genus *Dipodomys* (277-300 mm total length), with dusky cinnamon buff overfur, pure white underfur, and lateral white tail band about half as wide as the dorsal tail stripe at mid-tail; the tail is crested. Characteristics include external cheek pouches, large hind legs with five toes (including a small dew claw), small front legs, and a long tail (164-180 mm). Although all kangaroo rat species look superficially similar, the SKR can be distinguished from other local species by generally larger body size, broader face, less distinctly striped tail, and other subtle differences in coloration and the shape and size of ears, feet, bacula, and other features (CBI 2002).

Habitat

SKR are habitat specialists that occupy open grassland or sparse coastal sage scrub with a preponderance of annual forbs, few if any shrubs (less than 30 percent shrub cover), and abundant areas of bare ground. Typical habitat consists of native and non-native forbs, such as filaree (*Erodium* sp.), dove weed (*Eremocarpus setigerus*), tar plant (*Hemizonia* sp.), and goldfields (*Lasthenia* sp.). Dense grass or shrub cover can exclude this species from otherwise suitable habitat, presumably by interfering with the species' natural bounding movements and its ability to forage efficiently. SKR are primarily found on friable, loamy soils that facilitate burrowing. They are rarely found on soils high in clay or rock content, which make burrowing difficult, or on very sandy soils, in which burrows tend to collapse. The species sometimes uses clayey soils near more suitable habitat areas if there are sufficient burrows created by other rodents (especially ground squirrels or pocket gophers) that they can use.

SKR have been found from near sea level to about 1,250 meters elevation in grassland and sparse scrublands. Moister conditions that favor denser perennial vegetation may limit the upper elevational distribution. Although occasionally found on slopes approaching 45 percent, SKR tend to avoid slopes greater than about 39 percent, and seem most abundant on slopes of 7 to 11 percent (CBI 2002).

Life History

SKR are saltatorial (jumping), nocturnal, solitary, burrow-dwelling rodents. They primarily eat seeds, along with some green vegetation and occasional insects. They are

highly evolved to survive arid conditions and can persist indefinitely without drinking free water by obtaining required moisture from seeds and plant materials. True to their name, kangaroo rats have large hind limbs for jumping, small fore limbs, and long, tufted tails for balance. Their large eyes are adapted for night vision, and their greatly enlarged tympanic bullae (ear capsules) provide keen hearing (especially for low frequency sounds) and may aid in balance when animals are rapidly zig-zag hopping to avoid predators. Kangaroo rats, like other heteromyid rodents, also have external fur-lined cheek pouches to transport seeds. SKR are active year-round. Mating season is late spring and early summer with the average litter size being 2.5 individuals (Lackey 1967). Adult home ranges vary from 0.06 hectare (hc) to 0.10 hc (USFWS 1997). Home range size appears to be a function of population density (Thomas 1975). SKR can live for more than 18 months, with the average life span being between 3.7 months and 7.5 months (McCleaghan and Taylor 1993). Predators include owls, snakes, foxes, coyotes, and feral and domestic cats (Munger *et al.* 1983).

Distribution, Abundance and Trends

The SKR is restricted to the San Jacinto Valley and vicinity in western Riverside County, including the Anza area, and scattered grassland areas in northern and central San Diego County on or near Marine Corps Base Camp Pendleton, Fallbrook Naval Weapons Station, near Lake Henshaw, Rancho Guejito, and Ramona (CBI 2002). SKR may occupy other areas in San Diego County that have not been sufficiently surveyed, such as the Santa Ysabel Valley (CBI 2002). However, areas with apparently suitable habitat do not necessarily support SKR (USFWS 1997). Populations densities fluctuate greatly from year to year and location to location and can vary more than 10-fold in response to rainfall (Price and Endo 1989).

Threats and Limiting Factors

The SKR is threatened by habitat loss and fragmentation throughout its range (CBI 2002). In addition, human activities and land practices can result in the death of individual kangaroo rats. These threats include discing for weed abatement, pasture improvement, or dry farming, irrigation or spraying of sewage effluent on pastures, application of rodenticides and other rodent control measures, predation by domestic pets, overgrazing by livestock, and soil compaction by off-road vehicles (CBI 2002; USFWS 1997). Human development and agricultural expansion have removed an estimated 60 to 85 percent of suitable habitat in the species range (CBI 2002). Much of the remaining habitat consists of thin strips along roadways, at the base of hills, or around rocky areas where discing and farming are difficult. Consequently, SKR populations are scattered, with few core populations and many small isolated populations. This fragmentation prevents movement between stable populations and threatens genetic vigor by promoting inbreeding (CBI 2002).

Presence in the Action Area

Potential suitable habitat for this species occurs in the Action Area. Specifically, several areas within the CNF South Link, at MP 65.9; MPs 73.5, 73.8, 74.0, 74.3 and 75.5; MPs 82.6, 83.5, 87.1, 88.6, and 88.8, and within the Inland Valley South Link, at MPs 93.8

and 93.9; at MPs 103.1, 103.3, 103.4, 103.4, 103.6, and 103.8 include potential SKR habitat (Figure 15). The USFS has developed a digital habitat model to identify potential habitat for the SKR. The USFS model was used in concert with field habitat assessments to determine the potential presence of SKR in the portions of the Action Area that are within the CNF South Link. Results from the digital model indicated that potential SKR habitat occurs within several open grassland areas (Round Potrero Valley and Skye Valley) that the Project route crosses within the CNF South Link.

Although the Action Area was not specifically surveyed for SKR, the closest known population of this species occurs 12 to 15 miles north of the Action Area, in the grasslands near the Ramona Airport (CNDDB 2007; SDMNH 2008; USFWS 1997; CBI 2002). The topography between the Ramona grasslands and the Action Area is characterized by urbanization, steep slopes and dense brush and lacks the open habitat used by SKR for dispersal. Though this species occurs in several localities in northern San Diego County, it is not likely to occur in the Action Area because its historic and current range is several miles north of the western portion of the Action Area. Nonetheless, suitable habitat areas are treated as occupied habitat for purposes of this Biological Assessment.

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3.3.8 **Desert Bighorn Sheep** (*Ovis canadensis nelsoni*)

Status: Federal Endangered; State Threatened

Background

Desert bighorn sheep in the Peninsular Ranges, California - a Distinct Vertebrate Population Segment (DPS).

High quality bighorn sheep habitat is characterized by contiguous patches (greater than 2 square kilometers) of steep rugged terrain of greater than 60 percent slope and within 1 kilometer of perennial sources of water (McKinney *et al*. 2003; Turner *et al*. 2004). Steep terrain is necessary for bighorn sheep to escape from predators, and perennial water is necessary for them to survive during the high summer temperatures. Although bighorn sheep do venture away from escape terrain in search of forage (Bleich *et al*. 1997) and move between subpopulations (Bleich *et al*. 1996; Osterman *et al*. 2005), approximately ninety-five percent of their time is spent on or within 300 meters of escape habitat. That is because unbroken alluvial fans, open expanses of wash, and bajadas lack the topographic relief necessary to escape from predation (Turner 1976; Smith and Flinders 1991; Singer *et al*. 2000 *a* and *b*; Turner *et a*l. 2004).

Distribution, Abundance, Trends

Bighorn sheep (*Ovis canadensis*) extends in a discontinuous distribution from the Peace River in Canada, south through the Rocky Mountains, Great Basin, Sierra Nevada, eastern Cascades, and Peninsular Ranges, through the mountain ranges of the Mojave, Sonoran and Chihuahuan Deserts, and down to southern Baja and the states of Sonora and Chihuahua in northwestern Mexico. There are currently five recognized subspecies of bighorn sheep in western North America, and desert bighorn sheep (*Ovis canadensis nelsoni*) is one of these. The desert bighorn sheep occupying the Peninsular Ranges are one metapopulation (a group of interconnected subpopulations) of the desert bighorn

sheep subspecies that is found in mountain ranges across much of the desert Southwest (Wehausen and Ramey 1993; Torres *et al*. 1994; Boyce *et al*. 1999; USFWS 2007). This metapopulation of desert bighorn sheep was listed as a DPS under the ESA by the USFWS (USFWS 1998).

The Peninsular Ranges DPS is made up of eight permanently occupied ewe subpopulations, from Carrizo Canyon in the south to the San Jacinto Mountains in the north (Rubin *et al*. 1998; Boyce *et al*. 1999). These subpopulations form the basis of recovery units in the federal Recovery Plan for this DPS (USFWS 2000).

South of the U.S. - Mexico border, only a handful of sightings of desert bighorn sheep have been made within 40 kilometers of the border in the mountains of northern Baja (Sierra Cucapa and Sierra de Juarez), and there is no published evidence that these areas constitute more than transient use. Based on published helicopter survey data from the mid-1990's (Lee and Lopez-Saavedra 1994; Lopez *et al*. 1995; DeForge *et al*. 1996; Lee and Mellink 1996), the distribution of bighorn sheep is discontinuous in northernmost Baja, with the greatest concentrations of bighorn sheep in south and central Baja.

Between the border and Interstate 8, the historical population of 20-30 bighorn sheep was thought to have been extirpated in the mid-1980's. There is no current documented permanent bighorn sheep use between Interstate 8 and the U.S.-Mexico border, although there are reports of transient or seasonal use, presumably from bighorn sheep from the Carrizo subpopulation (USFWS 2008). The primary factors limiting permanent occupancy appear to be absence of permanent water sources and contiguous areas of escape terrain.

Threats and Limiting Factors

The decline of the desert bighorn sheep metapopulation in the Peninsular Ranges began in 1980 and was primarily the result of an exotic respiratory disease introduced from domestic livestock (DeForge *et al*. 1982; Turner and Payson 1982 *a* and *b*; Mullens and Dada 1992; Elliott *et al*. 1994). The precipitous decline of desert bighorn sheep in the Peninsular Ranges by respiratory disease is illustrated by Turner *et al*. 2004:

> The [Santa Rosa Mountains subpopulation] was estimated to be 350 animals in 1953; it remained stable through 1964 (Jones *et al*. 1954; Blong 1965) and increased to 500 animals in the late 1960s to mid 1970s, when it may have been the largest, densest, and most stable bighorn population in the state (Weaver and Mensch 1970; Weaver 1972 and 1975; USFWS 2000). In April 1977, the ewe:lamb ratio was 61:100, which declined to 7:100 by September. The following year the October ewe:lamb ratio was 9:100 (Weaver 1982). Depressed lamb survival, low recruitment, and premature adult mortality attributed to anthropogenic influences in concert with natural events (e.g., predation, falls, poor nutrition, inadequate water, disease epizootics) decreased the 1960–1970 population >75 percent by 1995.

More recently, in the 1990s, mountain lion predation was found to be a severely limiting factor to adult survival, with 69 percent of radio-collared ewes in one study dying of mountain lion predation (Hayes *et al*. 2000).

Anthropogenic-related factors, such as human disturbance, "urbanization", and habitat loss and fragmentation have been suggested to play a negative role in bighorn sheep population dynamics in the Peninsular Ranges (DeForge and Ostermann 1998; Rubin *et al*. 1998; USFWS 2000). However, their indirect effects on individual survival or population demography have been unquantified (Turner *et al*. 2004). In the case of human disturbance, plausible cause and effect mechanisms linking it to individual fitness or population-level demographic effects have been lacking.

By 2006, the bighorn sheep in the Peninsular Ranges had recovered to an estimated 793 adult and yearling animals (USFWS 2007), close to recovery levels set in the Fish and Wildlife Service Recovery Plan: 25 ewes per subpopulation and greater than 700 bighorn sheep overall (USFWS 2000).

Presence in Action Area

The southernmost known bighorn sheep ewe group occurs north of I-8 in Carrizo Canyon, which includes portions of the Tierra Blanca, In-ko-pah, Coyote, and Jacumba Mountains (Figure 16). Historically, a ewe group may have occurred south of I-8 (Weaver *et al*. 1968; Cunningham 1982), but had disappeared since the 1980s. The loss was poorly documented, but may have been the result of the construction of I-8 in the mid-1960s, railroad activity, livestock grazing, poaching, and fire suppression (Rubin *et al*. 1998; USFWS 2000). The project route would cross through two areas of Critical Habitat for desert bighorn sheep in the Peninsular Ranges, the In-ko-pah Gorge (through and adjacent to the I-8 "Island") and alluvial fans along the southern edge of the Coyote Mountains. These areas are considered part of the area used by the Carrizo Canyon ewe group. Although no desert bighorn were observed during vegetation mapping and rare plant surveys, the species is assumed to occur in this portion of the Action Area. Bighorn sheep have been observed in the Action Area in In-ko-pah Gorge/I-8 "Island", along with tracks and pellets from bighorn sheep and/or mule deer.

The Action Area contains approximately 346.7 acres of desert bighorn sheep Critical Habitat.

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4.0 EFFECTS OF THE ACTION

4.1 Introduction

This section describes the potential direct and indirect effects to listed species associated with the proposed federal actions under FLPMA and Section 404 of the Clean Water Act in light of the conservation measures that have been incorporated into the Project. The Project may adversely affect San Diego thornmint, San Bernardino bluegrass, quino checkerspot butterfly, Laguna Mountains skipper, arroyo toad, southwestern willow flycatcher, coastal California gnatcatcher, least Bell's vireo, Stephens' kanagaroo rat, and desert bighorn sheep

Effects to Critical Habitat for QCB, coastal California gnatcatcher, and desert bighorn sheep were analyzed to determine if the Project would be likely to destroy or adversely modify Critical Habitat. The analysis did not rely on the regulatory definition of adverse modification of Critical Habitat set forth in 50 C.F.R. § 402.02.

4.2 Methodology Used to Analyze Potential Effects of the Action

Permanent effects can be caused by the following facilities:

- Permanent construction and maintenance pads (100' x 100')
- Permanent construction and maintenance pads (35' x 75')
- Permanent pull sites
- Access roads

- Helipads
- Structure footings
- Substation pad, laydown pad, and impact area

Temporary effects can be caused by the following facilities:

- Temporary construction and maintenance pads (generally 200' x 400')
- Temporary pull sites
- Fly Yards / Staging Areas
- Helipads

Drawings contained in Appendix C illustrate all of the above facilities in different configurations:

GIS Analysis

The most current field-reviewed engineering data for project features (October Map Book) was used to conduct the analysis presented in this Biological Assessment. Overlapping features within and between the permanent and temporary impacts were removed using the "Layer Operations > Erase Features" in XTools Pro. The hierarchal order for the engineering components was Substation pad, laydown pad, and impact area followed by footings, permanent pads, permanent pull sites, access roads, temporary pads, temporary pull sites, and fly yards/staging areas. This resulted in 2 comprehensive shapefiles – "Impacts_Perm" and "Impacts_Temp". Since engineering components correspond to specific structures, 2 fields were added to each of the attribute tables – "Str_ID" (structure number) and "MP" (milepost). When necessary, access roads were cut at appropriate places, joined with the spur road and assigned to their corresponding structures. All source data was checked for its projection and if necessary was reprojected to State Plane, NAD 83, California VI, feet. Using the "Impacts_Perm" and "Impacts_Temp" shapefiles, each species, listed below, was individually intersected with each data source, also listed below. Each resulting intersected shapefile was thoroughly checked for quality, the acreage of impacts were calculated using XTools Pro, and tables for each species were made.

The following listed species were analyzed:

- San Diego thornmint (*Acanthomintha ilicifolia*)
- San Bernardino bluegrass (*Poa atropurpurea*)
- Quino checkerspot butterfly (*Euphydryas editha quino*)

- Laguna Mountains skipper (*Pyrgus ruralis lagunae*)
- Arroyo toad (*Bufo californicus*)
- Southwestern willow flycatcher (*Empidonax traillii extimus*)
- Coastal California gnatcatcher (*Polioptila californica californica*)
- Least Bell's vireo (*Vireo bellii pusillus*)
- Stephen's Kangaroo rat (*Dipodomys stephensi*)
- Peninsular bighorn sheep (*Ovis canadensis nelsoni DPS*)

The following data with their sources were used for analysis:

- CNDDB, California Fish & Game, Sept 2008
- Critical Habitat, U.S. Fish & Wildlife
- CNF Sensitive Species from USFS
- 2008 Quino survey (TRC)
- 2007 Quino survey (TRC)
- 2008 Hermes survey (TRC)
- 2008 Rare plant survey (J&S, Arcadis)
- 2007 Rare plant survey (J&S, Arcadis)
- 2006 Rare plant survey (J&S, Arcadis)
- 2007 Protocol Survey (Helix)
- 2007 Bio Survey (J&S, Arcadis)
- 2006 Bio Survey (J&S, Arcadis)

DEIR/EIS Sensitive Species (Aspen)

Vegetation Analysis

To conduct the vegetation analysis, Helix's vegetation layer called "Southern_Route_Vegetation_Current" received on 9-29-08 and supplemented where necessary with "Alternatives_Vegetation.mdb" received on 2-07-08 was used. These layers were comprised of various sources including fieldwork by Arcadis and Helix

biologists, and aerial interpretation. Using the same 2 shapefiles ("Impacts_Perm" and "Impacts_Temp") that were used for the species analysis, each shapefile was intersected with the vegetation layer, checked for quality, and acreages were calculated (See Table 1 in Appendix B).

Quantification of Effects to Habitat

Quantification of the Final Environmentally Superior Southern Route's impacts to least Bell's vireo, southwestern willow flycatcher, arroyo toad, and coastal California gnatcatcher include the results of the surveys conducted in 2007 and the use of a USFS GIS layer of suitable (modeled) habitat for each species (USFS 2007). In areas where habitat assessments were not conducted in accordance with protocols established by the USFS or where protocol surveys were not completed, the species were assumed to be present within the suitable (modeled) habitat. For desert bighorn sheep, all of the habitat in the Action Area is designated Critical Habitat. It was assumed that bighorn sheep were utilizing the Critical Habitat in the Action Area. For San Diego thornmint, the species was assumed present in the unsurveyed portion of the Action Area where appropriate gabbro soils are present, even though this area is several miles east of the eastern-most known location for the thornmint in this portion of San Diego County.

For QCB, impacts were calculated for all temporary and permanent impacts occurring between Milepost 27 to MP 119, which also falls within the USFWS Year 2005 Recommended Survey Areas 1 and 2 (USFWS, 2005). Only impacts occurring within appropriate habitat such as coastal sage scrub, chaparral, and disturbed areas were included in the calculations (areas designated as developed or agriculture were eliminated). QCB habitat is typically defined by the percent coverage and presence of host plant. The percent coverage was not available for the Action Area, so all scrub habitats were included in the impacts analysis even though this overstates the potential for actual impacts. Results of the effects analysis are presented in Table 6 as well as in the species-specific tables in Appendix B.

Table 2: Effects to Listed Species from the Environmentally Superior Southern Route

	Permanent Impacts (acres)	Temporary Impacts (acres)
Plant Species		
San Diego Thornmint		
Focused Surveys	0	0
USFS Suitable Habitat	0	0
USFS Occupied Habitat	0	0
Not yet surveyed - Assumed Present	18.46	73.94
Total	**18.46**	**73.94**
San Bernardino Bluegrass		
Designated Critical Habitat	0	0
USFS Suitable Habitat	1.85	9.36
Total	**1.85**	**9.36**
Animal Species		
Arroyo Toad		
Assumed Occupied Breeding Habitat	0.2	0
USFS Suitable Habitat	24.03	127.87
USFS Occupied Habitat	8.91	73.00
Total	**33.14**	**200.87**
Stephen's Kangaroo Rat		
Designated Critical Habitat	0	0
USFS Suitable Habitat	5.19	23.62
USFS Occupied Habitat	0	0
Total	**5.19**	**23.62**
Desert Bighorn Sheep in the Peninsular Ranges		
Designated Critical Habitat	30.65	112.99
Habitat Outside of Critical Habitat	0	0
Total	**30.65**	**112.99**
Least Bell's Vireo		
USFS Suitable Habitat	6.73	13.55
USFS Occupied Habitat	.09	0
Total	**6.82**	**13.55**
Coastal California Gnatcatcher		
Designated Critical Habitat	11.33	16.51
USFS Suitable Habitat	25.04	50.62
USFS Occupied Habitat	0	0
Total	**36.37**	**67.13**

Southwestern Willow Flycatcher		
Designated Critical Habitat	0	0
USFS Suitable Habitat	20.60	51.67
USFS Occupied Habitat	0	0
Total	**20.6**	**51.67**
Quino Checkerspot Butterfly		
Designated Critical Habitat	19.20	55.72
Not yet surveyed-Assumed Occupied Habitat	437.00	791.00
Total	**456.20**	**846.72**
Laguna Mountains Skipper		
USFS Modeled Habitat	1.85	9.36
USFS Occupied Habitat	0	0
Total	**1.85**	**9.36**

4.1 San Diego Thornmint

4.1.1 Effects from Construction Activities

4.1.1.1 Direct Effects

Construction activities could potentially adversely affect undiscovered populations of the species by damaging or killing individual plants and by permanently removing habitat occupied by the species. These direct effects could potentially result in the permanent loss of habitat and individuals, although the potential for the species to occur in the Action Area is low. Section 1.5 identifies avoidance and minimization measures that will reduce or eliminate the potential adverse effects from construction activities. Specifically, SDG&E would implement conservation Measure 1.5.1, which requires that protocol surveys be conducted in portions of the Action Area that have yet to be surveyed prior to beginning construction. If avoidance is not practicable, SDG&E would seek to salvage any individuals of the species discovered, as provided in 1.5.35. In addition, SDG&E would provide compensation for the permanent loss of occupied habitat, as provided in conservation Measure 1.5.35.

Table 2 shows both the permanent and temporary impacts on San Diego thornmint from construction of the project. Impacts are based on the GIS data provided by the Cleveland National Forest and the CNDDB. The CNF data includes both occupied and suitable (modeled) habitat for this species. There are no permanent or temporary impacts to thornmint based on this data. Nevertheless, based on the assumption that all unsurveyed areas with appropriate soils are occupied habitat, the Project would result in the permanent loss of 18.46 acres of habitat and the temporary disturbance of 73.94 acres of habitat. The area of these soil types is shown on Figure 7 and discussed in the species account above. This assumption greatly overstates the potential effect to this narrow

endemic species. Surveys will be conducted prior to construction to obtain an accurate estimate of impacts. Based on assumed levels of impact, mitigation for impacts to San Diego thornmint would result in the restoration of 73.94 acres of disturbed habitat and the off-site acquisition and preservation of 36.92 acres of occupied habitat.

4.1.1.2 Indirect Effects

Potential permanent indirect effects could occur if San Diego thornmint is determined to be present within or adjacent to the Action Area. Indirect effects could occur from invasive species, siltation, erosion, fugitive dust, and human disturbance.

Invasive Weeds

Invasive species can out-compete and displace native species. Disturbances and disturbed sites (e.g. construction areas) allow invasive species to become established and invade adjacent native communities. Section 1.5 identifies measures that will reduce the potential for invasive weeds to increase in the Action Area. Specifically, Measure 1.5.21 requires that SDG&E prepare and implement a Weed Control Plan.

Increased levels of fugitive dust in the Action Area could alter plant metabolic processes such as photosynthesis and respiration, which can result in reduced growth, vigor and reproduction. Dust deposited on leaves of plants can reduce photosynthetic rates by reducing gas exchange and light quantity and quality. Reducing the amount of carbon dioxide a plant can uptake would reduce photosynthetic rates. A film of dust on plant's leaves can also reduce the quantity and quality of light that a plant' chloroplast can capture for photosynthesis, additionally reducing photosynthetic rates. Reduction in photosynthetic rates could reduce plant growth, vigor and reproduction. Reducing gas exchange would also reduce transpiration rates and hence cooling. As transpiration rates decrease plants lose the ability to dissipate heat. As the plant's temperature increases respiration rates would subsequently increase. Increasing respiration rates result in plants depleting their food reserves more quickly, which could lead to reduced growth, vigor and reproduction. Permanent increased levels of fugitive dust are not anticipated as a result of the project because as relatively few new access roads are proposed for this area, and any increase in vehicular traffic is anticipated to be relatively low and to not generate significant increased levels of fugitive dust.

Increased erosion and subsequent down slope and downstream siltation, changes in stream flow volume, velocity and runoff rates from the bare surfaces of the project's permanent features could adversely affect populations that are immediately adjacent to the Action Area. However, SDG&E will implement erosion control measures that will eliminate the potential adverse effects from any permanent increases in erosion, siltation and hydrological flow rates. Specifically, SDG&E will implement Measures 1.5.30 and 1.5.31 to address erosion control within the Action Area.

Any indirect impacts from human disturbance (e.g. trampling or collecting plants) are not anticipated to occur. As mentioned previously, the potential for occurrence is low given this species known range. In addition, relatively few new access roads are proposed for the areas of potential habitat and, as such, increased human disturbance levels due to increased access are not expected.

Because of the relatively small amount of habitat lost to new permanent features, the location of these permanent features adjacent to an existing transmission line, and the relative porous nature of transmission lines (act as more a filter than a hard barrier), indirect impacts from habitat fragmentation and isolation are not anticipated.

Project related construction, grading, and/or clearing of vegetation during the construction of the permanent and temporary construction and maintenance pads and access roads could potentially adversely affect individuals of San Diego thornmint, if present, through the spread of fugitive dust, increased erosion and subsequent down-slope siltation.

Increased levels of fugitive dust could effect populations immediately adjacent to the Action Area. SDG&E will implement dust reduction procedures in Measure 1.5.32 that will eliminate the potential adverse effects from fugitive dust.

Temporary indirect effects from increased erosion and siltation during construction of the temporary and permanent construction and maintenance pads could occur. Individuals immediately adjacent to the Action Area would be most susceptible. SDG&E will prepare an Erosion Control Plan and Best Management Practices as outlined in Measures 1.5.30, 1.5.31, and 1.5.33 to eliminate the potential adverse effects from increases in erosion, siltation and hydrological flow rates.

Human Disturbance

Temporary indirect impacts from human disturbance associated with the construction crews could occur to individuals in or immediately adjacent to the Action Area. SDG&E will implement measures to eliminate or reduce the potential adverse effects from human disturbance. These measures include personnel training, prohibition on littering and collecting of plants.

4.1.2 Effects from Operations and Maintenance Activities

Adverse effects to San Diego thornmint could occur from vegetation management and ROW repair if populations occur within the Action Area. ROW repairs would include grading or repair of existing maintenance access roads and work areas, and spot repair of sites subject to flooding or scouring. Activities related to ROW repair are usually conducted after the rainy season, when water has caused erosion damage.

San Diego thornmint individuals immediately adjacent to structures and access roads could be affected by vegetation management activities and ROW repair. Section 1.5 identifies avoidance and minimization measures that will reduce the potential adverse effects from vegetation management and ROW repair. More specifically, implementation of Measures 1.5.7, 1.5.17, and 1.5.20 will reduce the potential adverse effects from vegetation management and ROW repair.

Temporary indirect impacts to San Diego thornmint could arise from insulator washing and fugitive dust from operational and maintenance activities if this species was determined to occur within the Action Area.

Insulator washing involves driving a water truck to within six feet of a tower base and using a high-pressure hose to spray deionized water at the insulators. A water truck is required for insulator washing. Insulator washing is not expected more than twice a year and would require 300 gallons of water per structure and 3,000 gallons of water per day. Insulator washing is not anticipated to adversely affect individuals near the structures. Much of the water dissipates and evaporates as water vapor and does not reach the soil surface, thus not posing a threat of erosion and siltation.

It is anticipated that the additional vehicular traffic from the operation and maintenance activities would not substantially increase the amount of fugitive dust above current levels.

4.1.3 Effects to Critical Habitat

There is no designated Critical Habitat within or immediately adjacent to the Action Area. As such, no permanent or temporary direct or indirect effects to Critical Habitat for San Diego thornmint would occur as a result of the Project.

4.2 San Bernardino Bluegrass

4.2.1 Effects from Construction Activities

4.2.1.1 Direct Effects

In the event that San Bernardino bluegrass occurs on site, construction activities could potentially adversely affect undiscovered populations of the species by damaging or killing individual plants and by permanently removing habitat occupied by the species. These direct effects could potentially result in the permanent loss of habitat and individuals, although the potential for the species to occur in the Action Area is low. Section 1.5 identifies avoidance and minimization measures that will reduce or eliminate the potential adverse effects from construction activities. If San Bernardino bluegrass is

detected within the Action Area during focused surveys, occupied areas would be delineated in accordance with Measure 1.5.7.

The Project would result in the permanent loss of 1.85 acres of USFS suitable habitat for San Bernardino bluegrass and the temporary disturbance of 9.36 acres of USFS suitable habitat for San Bernardino bluegrass. Impacts to San Bernardino bluegrass would result in the restoration of 9.36 acres of disturbed habitat and the off-site acquisition and preservation of 3.7 acres of occupied habitat.

4.2.1.2 Indirect Effects

Potential indirect effects could occur from invasive species, siltation, erosion, fugitive dust, and human disturbance.

Invasive Weeds

Invasive species can out-compete and displace native species. Disturbances and disturbed sites (e.g. construction areas) allow invasive species to become established and invade adjacent native communities. Section 1.5 identifies measures that will reduce the potential for invasive weeds to increase in the Action Area. Specifically, Measure 1.5.21 requires that SDG&E prepare and implement a Weed Control Plan.

Increased levels of fugitive dust in the Action Area could alter plant metabolic processes such as photosynthesis and respiration, which can result in reduced growth, vigor and reproduction. Dust deposited on leaves of plants can reduce photosynthetic rates by reducing gas exchange and light quantity and quality. Reducing the amount of carbon dioxide a plant can uptake would reduce photosynthetic rates. A film of dust on plant's leaves can also reduce the quantity and quality of light that a plant's chloroplast can capture for photosynthesis, additionally reducing photosynthetic rates. Reduction in photosynthetic rates could reduce plant growth, vigor and reproduction. Reducing gas exchange would also reduce transpiration rates and hence cooling. As transpiration rates decrease plants lose the ability to dissipate heat. As the plant's temperature increases respiration rates would subsequently increase. Increasing respiration rates result in plants depleting their food reserves more quickly, which could lead to reduced growth, vigor and reproduction. Permanent increased levels of fugitive dust are not anticipated as a result of the project because as relatively few new access roads are proposed for this area, and any increase in vehicular traffic is anticipated to be relatively low and to not generate significant increased levels of fugitive dust.

Increased erosion and subsequent down slope and downstream siltation, changes in stream flow volume, velocity and runoff rates from the bare surfaces of the project's permanent features could adversely affect populations that are immediately adjacent to the Action Area. However, SDG&E will implement erosion control measures that will eliminate the potential adverse effects from any permanent increases in erosion, siltation

and hydrological flow rates. Specifically, SDG&E will implement Measures 1.5.30 and 1.5.31 to address erosion control within the Action Area.

Any indirect impacts from human disturbance (e.g. trampling or collecting plants) are not anticipated to occur. As mentioned previously, the potential for occurrence is low to moderate given this species known range and elevation. In addition, relatively few new access roads are proposed for the areas of potential habitat and, as such, increased human disturbance levels due to increased access are not expected.

Because of the relatively small amount of habitat lost to new permanent features, the location of these permanent features adjacent to an existing transmission line, and the relative porous nature of transmission lines (act as more a filter than a hard barrier), indirect impacts from habitat fragmentation and isolation are not anticipated.

Project-related construction, grading, and/or clearing of vegetation during the construction of the permanent and temporary construction and maintenance pads and access roads could potentially adversely affect individuals of San Bernardino bluegrass, if present, through the spread of fugitive dust, increased erosion and subsequent down-slope siltation.

Increased levels of fugitive dust could affect populations immediately adjacent to the Action Area. SDG&E will implement dust reduction procedures in Measure 1.5.32 that will eliminate the potential adverse effects from fugitive dust.

Temporary indirect effects from increased erosion and siltation during construction of the temporary and permanent construction and maintenance pads could occur. Individuals immediately adjacent to the Action Area would be most susceptible. SDG&E will prepare an Erosion Control Plan and Best Management Practices as outlined in Measures 1.5.30, 1.5.31, and 1.5.33 to eliminate the potential adverse effects from increases in erosion, siltation and hydrological flow rates.

Human Disturbance

Temporary indirect impacts from human disturbance associated with the construction crews could occur if individual plants were present in or immediately adjacent to the Action Area. SDG&E will implement measures to eliminate or reduce the potential adverse effects from human disturbance. These measures include personnel training, prohibition on littering and collecting of plants.

4.2.2 Effects from Operations and Maintenance Activities

Adverse effects to San Bernardino bluegrass could occur from vegetation management and ROW repair. ROW repairs would include grading or repair of existing maintenance access roads and work areas, and spot repair of sites subject to flooding or scouring.

Activities related to ROW repair are usually conducted after the rainy season, when water has caused erosion damage.

In the event that San Bernardino bluegrass occurs immediately adjacent to structures and access roads, these individuals could be affected by vegetation management activities and ROW repair. Section 1.5 identifies avoidance and minimization measures that will reduce the potential adverse effects from vegetation management and ROW repair. More specifically, implementation of Measures 1.5.7, 1.5.17, and 1.5.20 will reduce the potential adverse effects from vegetation management and ROW repair.

Temporary indirect impacts to San Bernardino bluegrass could arise from insulator washing and fugitive dust from operational and maintenance activities if this species was determined to occur within the Action Area.

Insulator washing involves driving a water truck to within six feet of a tower base and using a high-pressure hose to spray deionized water at the insulators. A water truck is required for insulator washing. Insulator washing is not expected more than twice a year and would require 300 gallons of water per structure and 3,000 gallons of water per day. Insulator washing is not anticipated to adversely affect individuals near the structures. Much of the water dissipates and evaporates as water vapor and does not reach the soil surface, thus not posing a threat of erosion and siltation.

It is anticipated that the additional vehicular traffic from the operation and maintenance activities would not substantially increase the amount of fugitive dust above current levels.

4.2.3 Effects to Critical Habitat

There is no designated Critical Habitat within the Action Area. Therefore, no adverse effects to Critical Habitat will occur as a result of the Project.

4.3 Quino Checkerspot Butterfly

4.3.1 Effects from Construction Activities

4.3.1.1 Direct Effects

Direct effects occur when biological resources are altered, disturbed, destroyed, or removed during the course of project implementation. During construction of the project, direct impacts to QCB could occur due to loss of habitat.

Permanent effects such as habitat loss can occur due to the installation of permanent structures. This project will include installation of towers and poles, creation of new

access roads, and creation of new work pads adjacent to the towers and poles. Installation of the new MRD substation could also result in permanent loss of habitat. These impacts would result in the irreversible loss of biological resources. In the case of the QCB, this would include the permanent loss of vegetation (larval host plants and adult nectaring plants) that supports the species. Individual butterflies could also be killed.

Based on the assumption that appropriate vegetation types that have not been surveyed are occupied by QCB, approximately 456.20 acres of permanent habitat loss and 846.72 acres of temporary habitat loss could occur due to installation of towers and pole, new access roads, and construction of the MRD Substation (Table 2). This potential impact greatly overstates the impact likely to result from the Project. An accurate assessment of the amount of occupied habitat will be available once the surveys are complete. For the purpose of this Biological Assessment, it is assumed that the permanent loss of occupied habitat will not exceed 250 acres and temporary habitat loss will not exceed 425 acres. Loss of occupied habitat can be minimized as described in Measure 1.5.23, under which SDG&E would perform surveys for QCB. The pre-construction surveys for QCB will identify occupied habitat so that it can be avoided if practicable. Permanent effects can be further minimized during the design phase. Efforts can be made to place permanent structures in previously impacted areas or in areas containing lower quality habitat. SDG&E will implement Measure 1.5.23 to reduce or eliminate potential adverse effects to QCB and its habitat as a result of construction activities.

SDG&E will ensure that prior to construction, SDG&E's contractor, subcontractors, and project personnel receive environmental training. This training will cover the appropriate work practices necessary to effectively implement SDG&E's measures (Measure 1.5.2).

Measure 1.5.3 will reduce impacts to QCB and QCB habitat by restricting the construction of access roads and spur roads. This minimization measure restricts project vehicles to existing access roads and access roads constructed as part of the project, except when not feasible due to physical or safety constraints. In addition, even though the project would be allowed to construct new access roads year round, this measure requires that every effort would be made to avoid constructing roads during the bird nesting season, which overlaps the QCB flight season. If it is not feasible to construct new access roads outside of the flight season, then surveys for QCB will be preformed to determine presence in the work area. Survey results would be submitted to the USFWS and CDFG before off road vehicle use or new road construction.

SDG&E will also minimize impacts to QCB habitat by removing only the minimum amount of vegetation necessary for the construction of structures and facilities (Measure 1.5.16).

SDG&E will utilize a qualified biologist to conduct biological monitoring to ensure that all impacts occur within designated work limits, which will keep construction activities out of any adjacent QCB habitat. The biologist will monitor any area subject to

disturbance from construction activities and will document project compliance (Measure 1.5.19).

SDG&E will minimize and compensate for impacts to sensitive vegetation communities, which include QCB occupied or potentially occupied habitat (Measure 1.5.20). This measure requires that surface-disturbing components of the project (i.e. grubbing and grading) will be located in previously disturbed areas or where habitat quality is poor, to the extent possible, and disturbance of vegetation and soils will be minimized. This measure also requires that all limits of construction be delineated by orange construction fencing to eliminate and/or minimize inadvertent impacts to sensitive vegetation outside of the construction work limits.

Temporary effects are reversible, either naturally over time or with the implementation of measures such as onsite restoration. Potential temporary effects on QCB for this project include the temporary removal of occupied habitat. Temporary workspaces such as staging yards, helicopter fly yards, workspace adjacent to the tower locations, and stringing sites will be required during construction to facilitate installation of the project. Impacts to vegetation and the effects of heavy equipment and increased traffic in QCB habitat may result in adverse effects to individual QCB eggs, larvae, or pupae.

Temporary effects can be minimized during both the design phase and the construction phase of the project. During the design phase, efforts can be made to place temporary workspaces in previously impacted areas or in areas containing no QCB habitat or low-quality QCB habitat.

4.3.1.2 Indirect Effects

Potential indirect effects to QCB from project construction include increased traffic, dust, increase in human activities, and habitat degradation resulting from establishment of non-native species. Other indirect effects to QCB can result from the creation of new access roads, allowing increased access for off-road vehicles which could lead to more impacts to suitable habitat and individual mortalities. In addition, creating and grading roads can create suitable QCB habitat, as the species prefer openings within habitat that have a hard clay surface, such as an access road.

Construction Activities

Construction activities that can cause potential short term indirect impacts to QCB during the flight season are activities such as surveying on foot, brush clearing for foot paths, and stringing of new wire and reconductoring, which may require dragging the conductor through habitat, and off road vehicle activities in potential habitat.

To eliminate or minimize indirect impacts by these types of construction activities, Measure 1.5.8 requires approval from the biological monitor prior to any brush clearing for footpaths, line-of-sight cutting, and land surveying panel point placement in sensitive

habitat. For activities associated with stringing activities, this measure requires that SDG&E conduct surveys to determine presence or absence of QCB in the affected areas.

Human Disturbance

The presence of humans in potential QCB habitat can lead to potential indirect impacts. Indirect impacts from human disturbance can include walking or driving on larval host plants and degrading QCB habitat. Many of the measures already mentioned in this section can eliminate or minimize disturbance to QCB and QCB habitat by project personnel.

For human disturbance from non-project personnel, Measure 1.5.20 requires that entrances to access roads will be gated during and after construction to prevent the unauthorized use of these roads by the general public. Additionally, signs will be posted on the gates prohibiting unauthorized use of the access roads. Measure 1.5.3 requires the permanent closure of access road not needed for maintenance and that closed roads be monitored and maintained to assure that unauthorized access by the public is not occurring.

Invasive Weeds

So that QCB habitat is not degraded or reduced in quality as a result of project construction, any introduction of noxious weeds or exotic plants should be eliminated or minimized. SDG&E will develop and implement an Invasive Weed Control Plan (Measure 1.5.21).

4.3.2 Effects from Operations and Maintenance Activities

Standard O&M activities, such as road maintenance (grading), tree trimming, and structure replacement and repairs, could potentially impact QCB. SDG&E will implement measures 1.5.1, 1.5.3, 1.5.4, 1.5.19, and 1.5.23 to ensure that potential adverse effects to the species are avoided and minimized. These measures will include, but not be limited to the following

- Pre-activity surveys to determine presences/absence of QCB
- Minimization of required workspace
- Conduct activities outside the larval/flight season
- Onsite biological monitoring
- Fencing or flagging of work space limits
- Onsite habitat restoration
- Acquisition of off-site mitigation

4.3.3 Effects to Critical Habitat

The project would have potential permanent impacts to 19.20 acres of Quino Critical Habitat and potential temporary impacts to 55.72 acres of Critical Habitat (Table 2). These potential impacts would occur within the 9,970 acres of Critical Habitat in the Jacumba Unit (USFWS 2002). Temporary habitat disturbance would be restored and permanent effects would be offset through mitigation. SDG&E will acquire and preserve 38.40 acres to offset permanent impacts to 19.20 acres.

4.4 Laguna Mountains Skipper

4.4.1 Effects from Construction Activities

4.4.1.1 Direct Effects

Direct effects occur when biological resources are altered, disturbed, destroyed, or removed during the course of project implementation. During construction of the project, direct impacts to LMS could occur due to loss of habitat.

Permanent effects such as habitat loss can occur due to the installation of permanent structures. This project will include installation of towers and poles, creation of new access roads, and creation of new work pads adjacent to the towers and poles. Installation of the new MRD substation could also result in permanent loss of habitat. These impacts would result in the irreversible loss of biological resources. In the case of the LMS, this would include the permanent loss of vegetation (larval host plants and adult nectaring plants) that supports the species. Individual butterflies could also be killed.

USFS modeled habitat for LMS within the CNF South Link indicates that approximately 1.85 acres of permanent habitat loss and 9.36 acres of temporary habitat loss could occur due to installation of towers and poles, pull sites, pads and new access roads (Table 2). The pre-construction surveys for LMS will identify occupied habitat so that it can be avoided if practicable. If the protocol pre-construction survey is not conclusive for determining LMS absence, or if a survey is not conducted, then all suitable habitat areas would be considered potentially occupied and would require mitigation as follows. If construction occurs outside the larvae and adult activity season (June 1 through October 15) and stays at least 10 meters away from all host plant locations, then no mitigation is required. If construction occurs between October 16 and May 31 or within 10 meters of host plant locations, then (1) temporary impacts to the habitat will be mitigated through on-site restoration of temporarily disturbed areas and offsite acquisition and preservation of an equal sized area of LMS-occupied habitat (a 2:1 mitigation ratio) and (2) permanent impacts will be mitigated through off-site acquisition and preservation of LMS-occupied habitat at a 2:1 ratio (i.e., two acres acquired for each acre lost). Mitigation for the Project would include the off-site acquisition and preservation of 13.06 acres of LMS-occupied habitat and the on-site restoration 9.36 acres of temporarily disturbed areas. Permanent effects can be further minimized during the design phase. Efforts can be made to place permanent structures in previously impacted areas or in areas containing

lower quality habitat. SDG&E will implement Measure 1.5.4 to reduce or eliminate potential adverse effects to LMS and its habitat as a result of construction activities.

SDG&E will ensure that prior to construction, SDG&E's contractor, subcontractors, and project personnel receive environmental training. This training will cover the appropriate work practices necessary to effectively implement SDG&E's measures (Measure 1.5.2).

Measure 1.5.3 will reduce impacts to LMS and LMS habitat by restricting the construction of access roads and spur roads. This minimization measure restricts project vehicles to existing access roads and access roads constructed as part of the project, except when not feasible due to physical or safety constraints. In addition, even though the project would be allowed to construct new access roads year round, this measure requires that every effort would be made to avoid constructing roads during the bird nesting season, which overlaps the LMS flight season. If it is not feasible to construct new access roads outside of the flight season, then surveys for LMS will be preformed to determine presence in the work area. Survey results would be submitted to the USFWS and CDFG before off road vehicle use or new road construction.

SDG&E will also minimize impacts to LMS habitat by removing only the minimum amount of vegetation necessary for the construction of structures and facilities (Measure 1.5.16).

SDG&E will utilize a qualified biologist to conduct biological monitoring to ensure that all impacts occur within designated work limits, which will keep construction activities out of any adjacent LMS habitat. The biologist will monitor any area subject to disturbance from construction activities and will document project compliance (Measure 1.5.19).

SDG&E will minimize and compensate for impacts to sensitive vegetation communities, which include LMS occupied or potentially occupied habitat (Measure 1.5.20). This measure requires that surface-disturbing components of the project (i.e. grubbing and grading) will be located in previously disturbed areas or where habitat quality is poor, to the extent possible, and disturbance of vegetation and soils will be minimized. This measure also requires that all limits of construction be delineated by orange construction fencing to eliminate and/or minimize inadvertent impacts to sensitive vegetation outside of the construction work limits.

Temporary effects are reversible, either naturally over time or with the implementation of measures such as onsite restoration. Potential temporary effects on LMS for this project include the temporary removal of occupied habitat. Temporary workspaces such as staging yards, helicopter fly yards, workspace adjacent to the tower locations, and stringing sites will be required during construction to facilitate installation of the project. Impacts to vegetation and the effects of heavy equipment and increased traffic in LMS habitat may result in adverse effects to individual LMS eggs, larvae, or pupae.

Temporary effects can be minimized during both the design phase and the construction phase of the project. During the design phase, efforts can be made to place temporary workspaces in previously impacted areas or in areas containing no LMS habitat or low-quality LMS habitat.

4.4.1.2 Indirect Effects

Potential indirect effects to LMS from project construction include increased traffic, dust, increase in human activities, and habitat degradation resulting from establishment of non-native species. Other indirect effects to LMS can result from the creation of new access roads, allowing increased access for off-road vehicles which could lead to more impacts to suitable habitat and individual mortalities.

Construction Activities

Construction activities that can cause potential short term indirect impacts to LMS during the flight season are activities such as surveying on foot, brush clearing for foot paths, and stringing of new wire and reconductoring, which may require dragging the conductor through habitat, and off road vehicle activities in potential habitat.

To eliminate or minimize indirect impacts by these types of construction activities, Measure 1.5.8 requires approval from the biological monitor prior to any brush clearing for footpaths, line-of-sight cutting, and land surveying panel point placement in sensitive habitat. For activities associated with stringing activities, this measure requires that SDG&E conduct surveys to determine presence or absence of LMS in the affected areas.

Human Disturbance

The presence of humans in potential LMS habitat can lead to potential indirect impacts. Indirect impacts from human disturbance can include walking or driving on larval host plants and degrading LMS habitat. Many of the measures already mentioned in this section can eliminate or minimize disturbance to LMS and LMS habitat by project personnel.

For human disturbance from non-project personnel, Measure 1.5.20 requires that entrances to access roads will be gated during and after construction to prevent the unauthorized use of these roads by the general public. Additionally, signs will be posted on the gates prohibiting unauthorized use of the access roads. Measure 1.5.3 requires the permanent closure of access road not needed for maintenance and that closed roads be monitored and maintained to assure that unauthorized access by the public is not occurring.

Invasive Weeds

So that LMS habitat is not degraded or reduced in quality as a result of project construction, any introduction of noxious weeds or exotic plants should be eliminated or

minimized. SDG&E will develop and implement an Invasive Weed Control Plan (Measure 1.5.21).

4.4.2 Effects from Operations and Maintenance Activities

Standard O&M activities, such as road maintenance (grading), tree trimming, and structure replacement and repairs, could potentially impact LMS. SDG&E will implement measures 1.5.1, 1.5.3, 1.5.4, and 1.5.19 to ensure that potential adverse effects to the species are avoided and minimized. These measures will include, but not be limited to the following:

- Pre-activity surveys to determine presences/absence of LMS
- Minimization of required workspace
- Conduct activities outside the larval/flight season
- Onsite biological monitoring
- Fencing or flagging of work space limits
- Onsite habitat restoration
- Acquisition of off-site mitigation

4.4.3 Effects to Critical Habitat

There is currently no Critical Habitat designated for LMS. The Project will therefore have no effect on Critical Habitat.

4.5 Arroyo Toad

4.5.1 Effects from Construction Activities

This impact analysis is based on historical and current data for arroyo toad locations, habitat requirements, former proposed Critical Habitat (USFWS 2005), USFS modeled habitat (USFS 2007), aerial photographs, and habitat assessments conducted during the vegetation mapping surveys in spring 2007.

Construction activities could potentially directly adversely affect arroyo toads occurring within the Action Area. These impacts could occur as a result of habitat (breeding and upland) removal and would cause harm or harassment and direct disturbance to arroyo toads (injury or mortality by being crushed or run over either above ground or on borrows) and indirectly by increased siltation of breeding pools and downstream aquatic habitats, physical rearrangement of the substrate and stream terraces by construction vehicles on maintenance or access roads that cross creeks and drainages. Because the towers are generally placed on ridgelines and hilltops rather than in canyon bottoms and streambeds, impacts caused by tower installation generally would avoid arroyo toad

breeding habitat, but has potential to impact upland, non-breeding habitat. However, where access roads would cross creeks or drainages, arroyo toad breeding habitat would be permanently impacted. As discussed below, the project has been scheduled and designed to incorporate features to minimize and avoid potential impacts to this species.

Avoidance and minimization measures will be employed that will reduce or eliminate the potential adverse effects from construction activities. Specifically, SDG&E would conduct protocol surveys/clearance surveys in portions of the Action Area that have yet to be surveyed prior to beginning of any construction. If avoidance is not practicable, SDG&E would seek to salvage and relocate any individuals of the species discovered. In addition, SDG&E would provide compensation for the permanent and temporary loss of occupied arroyo toad habitat.

4.5.1.1 Direct Effects

Effects to the arroyo toad or occupied breeding or upland habitat from construction of the Project include 0.2 acres of permanent impacts to assumed occupied breeding habitat, 24.03 acres of permanent impacts to USFS suitable habitat, 8.91 acres of permanent impacts to USFS occupied habitat, 127.87 acres of temporary impacts to USFS suitable habitat and 73.00 acres of temporary impacts to USFS occupied habitat (Table 2). Permanent impacts from the construction activities include the direct loss of breeding habitat, loss of upland overwintering habitat, and crushing of egg masses, tadpoles, subadults, and adult toads with construction equipment and vehicles.

These impacts can be minimized as described in Measure 1.5.22, under which SDG&E would perform surveys for Arroyo toad. The pre-construction surveys for arroyo toad will identify occupied habitat so that it can be avoided if practicable. Direct effects can be further minimized through the implementation of Measures 1.5.22 and 1.5.29 and the appropriate avoidance and minimization strategies.

SDG&E will mitigate for the loss of arroyo toad occupied breeding habitat through offsite acquisition and preservation of occupied arroyo toad breeding habitat at a 3:1 ratio. Permanent impacts to occupied, upland habitat will be offset through offsite acquisition and preservation of occupied, upland habitat at a 2:1 ratio. Temporary impacts to occupied breeding habitat will be offset through 1:1 onsite restoration and 2:1 offsite acquisition and preservation of occupied breeding habitat. Temporary impacts to occupied, upland habitat will be offset through 1:1 onsite restoration and 1:1 offsite acquisition and preservation of occupied, upland habitat. The mitigation provided for arroyo toad occupied habitat would include 200.87 acres of onsite restoration and 267.35 acres of offsite acquisition and preservation of occupied toad habitat consisting of 0.60 acres of breeding habitat and 266.75 acres of upland habitat.

4.5.1.2 Indirect Effects

Construction activities, such as grading, tower footing excavation, and driving of heavy equipment on unpaved roadways could increase dust that may settle on surrounding vegetation. Such dust would be considered an indirect impact that would degrade the overall quality of arroyo toad habitat. Other potential indirect impacts include increased siltation of breeding pools, physical rearrangement of the substrate and stream terraces by construction vehicles and unauthorized traffic (ATVs, mountain bikes, hikers, horses) on maintenance roads. Adverse effects remaining after implementation of the avoidance and minimization measures will be offset through mitigation.

4.5.2 Effects from Operations and Maintenance Activities

Maintenance vehicles would be restricted to existing access roads, new project access roads, and maintenance pads to perform required maintenance operations (inspections, insulator washing, access road grading, etc.). No additional arroyo toad habitat disturbance or loss is expected from routine maintenance activities.

If this species were to be on the road or in the maintenance areas when they are being used, arroyo toads could be crushed or run over during these operation activities. Maintenance vehicles will be restricted to existing access roads, new project access roads, and maintenance pads to perform required maintenance operations (inspections, insulator washing, access road grading, etc.).
Potential indirect impacts include increased siltation of breeding pools and downstream aquatic habitats, physical rearrangement of the substrate and stream terraces by construction vehicles and by unauthorized traffic (ATVs, mountain bikes, hikers, horseback riders) on maintenance or access roads (Measure 1.5.22).

4.5.3 Effects to Critical Habitat

The Action Area does not fall within and is not near any of the areas designated by the USFWS as Critical Habitat for this species (USFWS 2005). The Project will therefore have no effect on arroyo toad Critical Habitat.

4.6 Southwestern Willow Flycatcher

4.6.1 Effects from Construction Activities

4.6.1.1 Direct Effects

Direct effects occur when biological resources are altered, disturbed, destroyed, or removed during the course of project implementation. During construction of the project, direct impacts to southwestern willow flycatcher could occur due to loss of habitat.

Permanent effects such as habitat loss can occur due to the installation of permanent structures. This project will include installation of towers and poles, creation of new access roads, and creation of new work pads adjacent to the towers and poles. Installation of the new substation sites could also result in permanent loss of habitat. These impacts would result in the irreversible loss of biological resources. In the case of the southwestern willow flycatcher, this would include the permanent loss of vegetation that supports the subspecies. Permanent direct effects could also include the "take" of the individual bird or loss of a nest.

To assess impacts to southwestern willow flycatcher, all temporary and permanent impacts occurring within appropriate habitat such as riparian scrub and riparian woodland between Mileposts 53 to 119 were included in the calculations. Impacts to other vegetation types were eliminated. Approximately 20.60 acres of permanent habitat loss could occur due to installation of towers and pole, new access roads, and construction of the MRD Substation (Table 2).

These permanent impacts can be minimized as described in Measure 1.5.27, which provides SDG&E will perform protocol surveys for southwestern willow flycatcher so that any occupied habitat can be avoided.

Permanent effects can be further minimized during the design phase. Efforts can be made to place permanent structures in previously impacted areas or in areas containing lower quality habitat. SDG&E will implement Measure 1.5.15 to reduce or eliminate potential adverse effects to southwestern willow flycatcher and its habitat as a result of construction activities.

Prior to construction, SDG&E will ensure that SDG&E's contractor, subcontractors, and project personnel receive environmental training (Measure 1.5.2). This training will cover the appropriate work practices necessary to effectively implement SDG&E's measures. The training will include compliance with the applicable environmental laws and regulations including appropriate wildlife avoidance, and impact minimization procedures, the importance of these resources and the purpose and necessity of protecting them and the methods for protecting sensitive ecological resources, including southwestern willow flycatcher and its habitat.

SDG&E will reduce impacts to southwestern willow flycatcher habitat by restricting the construction of access roads and spur roads (Measure 1.5.3). This minimization measure restricts project vehicles to existing access roads and access roads constructed as part of the project, except when not feasible due to physical or safety constraints. In addition, even though the project would be allowed to construct new access roads year round, this measure requires that every effort would be made to avoid constructing roads during the nesting season. If not feasible, SDG&E would perform a site survey, or more as appropriate, in the area where the work is to occur. This survey would be performed to determine presence or absence of threatened or endangered nesting birds, or other

proposed or listed species in the work area. SDG&E would submit results of this survey to the USFWS and CDFG prior to vehicle use off existing access roads or the construction of new access roads.

If new access roads or spur roads must be built across streambeds and/or washes then SDG&E would construct the roads at right angles to streambeds and washes if feasible (Measure 1.5.5). This will reduce impacts to potential southwestern willow flycatcher habitat if riparian vegetation is located along these streambeds and washes. If it is not feasible to build the roads at a right angle, then SDG&E would limit road construction parallel to streambeds or washes to a maximum length of 500 feet at any one transmission line crossing location. Additionally, all construction and maintenance activities for these roads would be conducted such that disturbance to riparian vegetation would be minimized. If there is potential for southwestern willow flycatcher at these locations, surveys to determine the presence/absence of southwestern willow flycatcher would be conducted prior to construction. If southwestern willow flycatcher is present than all appropriate and reasonable measures to avoid or minimize potential impacts would be implemented.

SDG&E will also minimize impacts to southwestern willow flycatcher habitat by requiring only the minimum amount of vegetation necessary for the construction of structures and facilities to be removed (Measure 1.5.16).

Measure 1.5.19 requires biological monitoring by a qualified biologist to ensure that all impacts occur within designated work limits, which will keep construction activities out of any adjacent southwestern willow flycatcher habitat. The biologist will monitor any area subject to disturbance from construction activities and document project compliance.

SDG&E will minimize and compensate for impacts to sensitive vegetation communities, which include southwestern willow flycatcher occupied or potentially occupied habitat (Measure 1.5.20). This measure requires that surface-disturbing components of the project (i.e. grubbing and grading) will be located in previously disturbed areas or where habitat quality is poor, to the extent possible, and disturbance of vegetation and soils will be minimized. This measure also requires that all limits of construction be delineated by orange construction fencing to eliminate and/or minimize inadvertent impacts to sensitive vegetation outside of the construction work limits.

If any of the jurisdictional areas potentially affected by the project has riparian vegetation that could potentially support southwestern willow flycatcher, then Measure 1.5.27 could eliminate or minimize impacts to southwestern willow flycatcher habitat. This minimization measure requires that impacts to jurisdictional areas potentially supporting southwestern willow flycatcher be avoided to the extent feasible.

SDG&E will conduct all brushing or grading construction activities within riparian habitats of the southwestern willow flycatcher between September 16 and March 14, which is outside of the southwestern willow flycatcher breeding season (Measure 1.5.27).

This will eliminate direct impacts to southwestern willow flycatcher during the breeding season for this construction activity.

To further minimize or eliminate additional potential impacts to southwestern willow flycatcher, Measure 1.5.27 requires that focused surveys be conducted by a qualified biologist one week prior to start of construction activity for all other construction activities conducted during the breeding season and within 500 feet of habitat in which southwestern willow flycatcher are known to occur or have potential to occur. If southwestern willow flycatcher is present, then a permitted biologist will survey for nesting activity approximately once per week within 500 feet of the construction activity for the duration of the activity during the breeding season. If an active nest is located, then a 300-foot no-construction buffer will be established, if feasible, around the nest site until the nest site is no longer active. If construction must occur within 300 feet of an active southwestern willow flycatcher nest, then a qualified biological monitor and a qualified acoustician will monitor southwestern willow flycatcher nesting activities and construction noise levels. If the biologist determines that construction is disturbing nesting activities and/or the construction noise levels meets or exceeds the 60 dB(A) Leg threshold, then construction will be stopped and the biologist will consult with the Wildlife Agencies on methods to reduce the noise and/or disturbance in the vicinity of the nesting southwestern willow flycatcher before construction can resume in this area.

SDG&E will mitigate for the permanent loss of occupied southwestern willow flycatcher habitat and/or designated Critical Habitat (Measure 1.5.27). This measure requires off-site acquisition and preservation of occupied habitat or designated Critical Habitat at a 3:1 ratio. The protocol-level pre-construction surveys for southwestern willow flycatcher, in combination with the additional described measures, will reduce the adverse permanent affects that could occur due to habitat loss.

Temporary effects are reversible, either naturally over time or with the implementation of measures such as onsite restoration. Potential temporary direct effects on southwestern willow flycatcher for this project include the temporary removal of occupied habitat. Temporary workspaces such as staging yards, helicopter fly yards, workspace adjacent to the tower locations, and stringing sites will be required during construction to facilitate installation of the project. Short-term disturbance of individuals not resulting in death or injury could also occur.

The temporary habitat loss of 51.67 acres of occupied habitat could occur due to installation of workspaces, such as fly yards, staging sites, and pull sites. SDG&E would mitigate for southwestern willow flycatcher occupied habitat through onsite restoration of 51.67 acres and offsite acquisition and preservation of 165.17 acres of southwestern willow flycatcher occupied habitat.

Temporary effects from habitat loss can be minimized during both the design phase and the construction phase of the project. During the design phase, efforts can be made to

place temporary workspaces in previously impacted areas or in areas containing low quality habitat.

SDG&E will offset impacts to habitat through mitigation (Measure 1.5.27). Temporary impacts to occupied habitat or designated Critical Habitat will include 1:1 on-site restoration and 2:1 off-site acquisition and preservation of occupied habitat or designated Critical Habitat.

Temporary effects, other than habitat loss, associated with construction activities include short-term noise events. Direct disturbance in potential southwestern willow flycatcher habitat would be considered a temporary impact because construction activities at isolated sites would occur over short periods of time (e.g., one to two weeks) and would primarily impact southwestern willow flycatcher only if it occurred during the breeding season. Measure 1.5.27 will effectively reduce these impacts by eliminating some construction activities (grading and grubbing) in southwestern willow flycatcher habitat during the breeding season and by requiring avoidance of other construction activities, if feasible. When not feasible to avoid construction activities in occupied habitat during the breeding season, additional components of this measure, such as monitoring and no-constriction buffer areas, would be in effect to minimize temporary impacts to this subspecies.

4.6.1.2 Indirect Effects

Potential indirect effects to southwestern willow flycatchers from project construction include increased noise levels, increased vulnerability to predation, increase in human activities, and habitat degradation resulting from the establishment of non-native species.

Construction Activities

Construction activities that can cause potential short term indirect impacts to southwestern willow flycatchers during the breeding season are activities such as surveying on foot, brush clearing for foot paths, and stringing of new wire and reconductoring, which may require dragging the conductor through habitat, and off road vehicle activities in potential habitat.

To eliminate or minimize indirect impacts by these types of construction activities, Measure 1.5.8 requires approval from the biological monitor before surveying and clearing brush on foot can occur in southwestern willow flycatchers.

Indirect Noise Impacts from Construction

Construction noise may cause potential short-term indirect impacts to nesting bird species, if present, including the southwestern willow flycatcher. Increased ambient noise levels during temporary short-term construction activities may mask the breeding songs used southwestern willow flycatcher. Additionally, intermittent loud noises from short-term construction activities may also cause nesting southwestern willow flycatcher

to become startled and abandon their nest. The measures discussed in Measure 1.5.27 will effectively reduce potential indirect effects to nesting birds

Predation

Transmission lines and support structures provide potential perching opportunities for raptor and corvid species, which can increase the potential for indirect impacts from predation of southwestern willow flycatcher by raptors and corvids. To minimize potential impacts by corvids specifically, Measure 1.5.25 requires the preparation and implementation of a raven control plan. Indirect impacts from new perch sites on pole or tower support structures for brown-headed cowbirds, which are nest parasites, are also likely. In areas where current perching sites are few or rare, the construction of a new transmission line increases the potential for raptor, corvids, and cowbird perching and hence, predation and nest parasitism opportunities in the project area (APLIC 2006; Jalkotzy *et al*. 1997).

In portions of the project located in SDG&E's existing ROW, installation of new steel and wood pole support structures and the upgrading of existing structures will not significantly increase perching opportunities for raptors in the area.

Indirect impacts from increased nest parasitism as a result of new perch sites on pole or tower support structures are also unlikely to occur because many perch sites for cowbirds already occur on the existing utility towers and poles within the existing ROW and in trees within the small habitat patches currently supporting riparian-dependent wildlife within the vicinity of the existing ROW.

Construction activities that open up areas in native habitat, such as work areas and trails, and project personnel leaving food trash and debris in the work area can potentially attract predators to the work area leading to indirect impacts from predation. Predators such as common ravens, western scrub jays, and coyote can all be attracted to the work area by the above activities and they have the potential to prey on southwestern willow flycatcher nests (Sedgwick 2001). To eliminate or minimize predator attraction, SDG&E would minimize disturbance to sensitive vegetation, prohibit littering of any food or waste in the project area, and ensure the removal of biodegradable or non-biodegradable debris from the ROW following completion of construction. (Measure 1.5.20, Measure 1.5.6).

Human Disturbance

The presence of humans in potential southwestern willow flycatcher habitat during the breading season can lead to potential indirect impacts. Indirect impacts from human disturbance can include temporarily changing southwestern willow flycatcher breeding and nesting behavior, which can affect their ability to mate, build nests, and care for young on the nest. Many of the measures already mentioned in this section can eliminate or minimize disturbance to breeding or nesting southwestern willow flycatchers by project personnel.

For human disturbance from non-project personnel, Measure 1.5.20 requires that entrances to access roads will be gated during and after construction to prevent the unauthorized use of these roads by the general public. Additionally, signs will be posted on the gates prohibiting unauthorized use of the access roads. Measure 1.3 requires the permanent closure of access road not needed for maintenance and that closed roads be monitored and maintained to assure that unauthorized access by the public is not occurring.

Invasive Weeds

So that southwestern willow flycatcher habitat is not degraded or reduced in quality as a result of project construction, any introduction of noxious weeds or exotic plants should be eliminated or minimized. SDG&E will develop and implement an Invasive Weed Control Plan (Measure 1.5.21).

4.6.2 Effects from Operation and Maintenance Activities

O&M activities, such as road maintenance (grading), tree trimming, and structure replacement and repairs, could potentially impact southwestern willow flycatcher. SDG&E will implement measures 1.5.1, 1.5.3, 1.5.4, 1.5.19, and 1.5.27 to ensure that potential adverse effects to the species are avoided and minimized. These measures will include, but not be limited to the following:

- Pre-activity surveys to determine presences/absence of southwestern willow flycatchers
- Minimization of required workspace
- Conduct activities outside the breeding season
- Onsite biological monitoring
- Fencing or flagging of work space limits
- Onsite habitat restoration
- Acquisition of off-site mitigation

Measure 1.5.27 addresses potential impacts from maintenance activities to the southwestern willow flycatcher. This mitigation measure requires that SDG&E train all maintenance personnel on the sensitive resources associated with the project and the necessity to avoid and minimize impacts to them. The measure requires all vegetation clearing to occur outside of the bird breeding season if the vegetation has not been cleared in the last two years. All other maintenance activities are to occur outside of the bird breeding season if feasible. If it is not feasible to schedule maintenance activities outside of the bird breeding season, then a qualified biologist working with an acoustician will determine if a maintenance activity would meet or exceed the 60 db(A) Leq hourly noise threshold where nesting territories of southwestern willow flycatchers are located. If noise levels are below this threshold, then the maintenance activity can proceed, if not, then a survey to locate southwestern willow flycatcher nests would be conducted. If an active nest is found, then all necessary impact avoidance and minimization methods will

be employed, such as a biological monitor on site, continued noise monitoring, and noise reduction methods, or waiting until the young has fledged from the nest.

4.6.3 Effects to Critical Habitat

The Action Area does not fall within designated Critical Habitat for the southwestern willow flycatcher. Therefore, no adverse effects to Critical Habitat will occur as a result of the Project.

4.7 Coastal California Gnatcatcher

4.7.1 Effects from Construction Activities

4.7.1.1 Direct Effects

Direct effects occur when biological resources are altered, disturbed, destroyed, or removed during the course of project implementation. During construction of the project, direct impacts to coastal California gnatcatcher could occur due to loss of habitat.

Permanent effects such as habitat loss can occur due to the installation of permanent structures. This project will include installation of towers and poles, creation of new access roads, and creation of new work pads adjacent to the towers and poles. Installation of the new substation could also result in permanent loss of habitat.

Based on historical data and various other sources, as described in Section 3.2.7, coastal California gnatcatcher has been know to occur between MPs 71 and 120. Because reconnaissance level surveys have not yet been conducted for a majority of this area along the route, it is assumed to be potential coastal California gnatcatcher habitat. Approximately 36.37 acres of permanent habitat loss could occur due to installation of towers and pole, new access roads, and construction of the MRD Substation (Table 2). SDG&E will mitigate for the permanent loss of coastal California gnatcatcher occupied habitat through off-site acquisition and preservation of occupied habitat at a 2:1 ratio (Measure 1.5.26). Mitigation would consist of 72.74 acres of occupied habitat.

The potential for permanent impacts can be minimized as described in Measure 1.5.26, which provides SDG&E will perform protocol surveys for coastal California gnatcatcher so that any occupied habitat can be avoided where practicable.

Permanent direct effects can be further minimized during the design phase. Efforts can be made to place permanent structures in previously impacted areas or in areas containing lower quality habitat. SDG&E will implement Measure 1.5.15 to reduce or eliminate potential adverse effects to coastal California gnatcatcher and its habitat as a result of construction activities.

Prior to construction, SDG&E will ensure that SDG&E's contractor, subcontractors, and project personnel receive environmental training. This training will cover the appropriate work practices necessary to effectively implement SDG&E's measures (Measure 1.5.2).

SDG&E will reduce impacts to coastal California gnatcatcher habitat by restricting the construction of access roads and spur roads (Measure 1.5.3). This minimization measure restricts project vehicles to existing access roads and access roads constructed as part of the project, except when not feasible due to physical or safety constraints. In addition, even though the project would be allowed to construct new access roads year round, this measure requires that every effort would be made to avoid constructing roads during the nesting season. If not feasible, SDG&E would perform a site survey, or more as appropriate, in the area where the work is to occur. This survey would be performed to determine presence or absence of threatened or endangered nesting birds, or other proposed or listed species in the work area. SDG&E would submit results of this survey to the USFWS and CDFG prior to vehicle use off existing access roads or the construction of new access roads.

SDG&E will also minimize impacts to coastal California gnatcatcher habitat by requiring only the minimum amount of vegetation necessary for the construction of structures and facilities to be removed (Measure 1.5.16).

Measure 1.5.19 requires biological monitoring by a qualified biologist to ensure that all impacts occur within designated work limits, which will keep construction activities out of any adjacent coastal California gnatcatcher habitat. The biologist will monitor any area subject to disturbance from construction activities and document project compliance.

SDG&E will minimize and compensate for impacts to sensitive vegetation communities, which include coastal California gnatcatcher occupied or potentially occupied habitat (Measure 1.5.20). This measure requires that surface-disturbing components of the project (i.e. grubbing and grading) will be located in previously disturbed areas or where habitat quality is poor, to the extent possible, and disturbance of vegetation and soils will be minimized. This measure also requires that all limits of construction be delineated by orange construction fencing to eliminate and/or minimize inadvertent impacts to sensitive vegetation outside of the construction work limits.

SDG&E will conduct all brushing or grading construction activities within occupied coastal California gnatcatcher habitat between September 1 and February 14, which is outside of the coastal California gnatcatcher breeding season (Measure 1.5.26). This will eliminate direct impacts to coastal California gnatcatchers and occupied habitat during the breeding season from brushing and grading.

To further minimize or eliminate additional potential impacts to coastal California gnatcatcher, Measure 1.5.26 requires that for all other construction activities conducted during the coastal California gnatcatcher breeding season (February 15 through August

30) within occupied habitat, focused surveys for nesting coastal California gnatcatchers will be conducted by a qualified biologist one week prior to start of construction activity within 500 feet of the construction area. If an active nest is located, then a 300-foot no-construction buffer will be established, if feasible, around the nest site until the nest site is no longer active. If construction must occur within 300 feet of an active nest, then a qualified biological monitor and a qualified acoustician will monitor gnatcatcher nesting activities and construction noise levels. If the biologist determines that construction is disturbing nesting activities or the construction noise levels meets or exceeds the 60 dB(A) Leg threshold, then construction will be stopped and the biologist will consult with the Wildlife Agencies on methods to reduce the noise or disturbance in the vicinity of the nesting gnatcatchers before construction can resume in this area.

Approximately 67.13 acres of temporary habitat disturbance could occur due to installation of workspaces, such as fly yards, staging sites, and pull sites. Of this total approximately 16.51 acres of temporary impacts are expected to occur in USFWS designated Critical Habitat (Table 2). Temporary impacts to occupied habitat will be mitigated at a 2:1 ratio and will include 1:1 on-site restoration and 1:1 off-site acquisition and preservation of occupied habitat.

Mitigation for the temporary loss of occupied gnatcatcher habitat would consist of 67.13 acres of onsite restoration and 67.13 acres of offsite acquisition and preservation of occupied gnatcatcher habitat.

Temporary effects from habitat loss can be minimized during both the design phase and the construction phase of the project. During the design phase, efforts can be made to place temporary workspaces in previously impacted areas or in areas containing low quality habitat.

Temporary effects are reversible, either naturally over time or with the implementation of measures such as onsite habitat restoration. Potential temporary effects to coastal California gnatcatcher for this project include the temporary removal of occupied habitat. Temporary workspaces such as staging yards, helicopter fly yards, workspace adjacent to the tower locations, and stringing sites will be required during construction to facilitate installation of the project.

Temporary effects, other than habitat disturbance, associated with construction activities include short-term noise events. Direct disturbance in potential coastal California gnatcatcher habitat would be considered a temporary impact because construction activities at isolated sites would occur over short periods of time (e.g., one to two weeks) and would primarily impact gnatcatchers only if it occurred during the breeding season. Measure 1.5.26 will effectively reduce these impacts by eliminating some construction activities (grading and grubbing) in coastal California gnatcatcher habitat during the breeding season and by requiring avoidance of other construction activities, if feasible, in occupied coastal California gnatcatcher habitat during the breeding season. When not feasible to avoid construction activities in occupied habitat during the breeding season,

additional components of this measure, such as monitoring and no-constriction buffer areas, would be in effect to minimize temporary impacts to this subspecies.

4.7.1.2 Indirect Effects

Potential indirect effects to coastal California gnatcatchers from Project construction include increased noise levels, increased vulnerability to predation, increase in human activities, and habitat degradation resulting from the establishment of non-native species.

Construction Activities

Construction activities that can cause potential short term indirect impacts to coastal California gnatcatchers during the breeding season are activities such as surveying on foot, brush clearing for foot paths, and stringing of new wire and reconductoring, which may require dragging the conductor through habitat, and off road vehicle activities in potential habitat.

To eliminate or minimize indirect impacts by these types of construction activities, Measure 1.5.8 requires approval from the biological monitor before surveying and clearing brush on foot can occur in gnatcatcher habitat.

Indirect Noise Impacts from Construction

Construction noise may cause potential short-term indirect impacts to nesting bird species, if present, including the coastal California gnatcatcher. Increased ambient noise levels during temporary short-term construction activities may mask the breeding songs used coastal California gnatcatcher. Additionally, intermittent loud noises from short-term construction activities may also cause nesting gnatcatchers to become startled and abandon their nest. These potential temporary short-term impacts may be considered a take of a listed species if construction-related noise levels cause abandonment of nests. The measures discussed in Measure 1.5.30 will effectively reduce potential indirect effects to nesting birds.

Predation

Transmission lines and support structures provide potential perching opportunities for raptor and corvid species, which can increase the potential for indirect impacts from predation of coastal California gnatcatcher by raptors and corvids. To minimize potential impacts by corvids specifically, Measure 1.5.25 requires the preparation and implementation of a raven control plan. Indirect impacts from new perch sites on pole or tower support structures for brown-headed cowbirds, which are nest parasites, are also likely. In areas where current perching sites are few or rare, the construction of a new transmission line increases the potential for raptor, corvids, and cowbird perching and hence, predation and nest parasitism opportunities in the project area (APLIC 2006; Jalkotzy *et al*. 1997).

In portions of the project located in SDG&E's existing ROW, installation of new steel and wood pole support structures and the upgrading of existing structures will not significantly increase perching opportunities for raptors in the area.

Indirect impacts from increased nest parasitism as a result of new perch sites on pole or tower support structures are also unlikely to occur because many perch sites for cowbirds already occur on the existing utility towers and poles within the existing ROW and in trees within the small habitat patches currently supporting riparian-dependent wildlife within the vicinity of the existing ROW.

Construction activities that open up areas in native habitat, such as work areas and trails, and project personnel leaving food trash and debris in the work area can potentially attract predators to the work area leading to indirect impacts from predation. Predators such as common ravens, western scrub jays, and coyote can all be attracted to the work area by the above activities and they have the potential to prey on coastal California gnatcatcher nests. To eliminate or minimize predator attraction, SDG&E will minimize disturbance to sensitive vegetation, prohibit littering of any food or waste in the project area, and remove biodegradable or non-biodegradable debris from the ROW following completion of construction (Measure 1.5.20, Measure 1.5.6).

Human Disturbance

The presence of humans in potential coastal California gnatcatcher habitat during the breading season can lead to potential indirect impacts. Indirect impacts from human disturbance can include temporarily changing gnatcatcher breeding and nesting behavior, which can affect their ability to mate, build nests, and care for young on the nest. Many of the measures already mentioned in this section can eliminate or minimize disturbance to breeding or nesting gnatcatchers by project personnel.

For human disturbance from non-project personnel, Measure 1.5.20 requires that entrances to access roads will be gated during and after construction to prevent the unauthorized use of these roads by the general public. Additionally, signs will be posted on the gates prohibiting unauthorized use of the access roads. Measure 1.3 requires the permanent closure of access road not needed for maintenance and that closed roads be monitored and maintained to assure that unauthorized access by the public is not occurring.

Invasive Weeds

So that coastal California gnatcatcher habitat is not degraded or reduced in quality as a result of project construction, any introduction of noxious weeds or exotic plants should be eliminated or minimized. SDG&E will develop and implement an Invasive Weed Control Plan (Measures 1.5.21).

4.7.2 Effects from Operation and Maintenance Activities

Standard O&M activities, such as road maintenance (grading), tree trimming, and structure replacement and repairs, O&M activities could potentially affect coastal California gnatcatcher. SDG&E will implement measures 1.5.1, 1.5.3, 1.5.4, 1.5.19, and 1.5.26 to ensure that potential adverse effects to the species are avoided and minimized. These measures include the following:

- Pre-activity surveys to determine presences/absence of gnatcatchers
- Minimization of required workspace
- Conduct activities outside the breeding season
- Onsite biological monitoring
- Fencing or flagging of work space limits
- Onsite habitat restoration
- Acquisition of off-site mitigation

Measure 1.5.26 addresses potential impacts from maintenance activities to coastal California gnatcatcher. This minimization measure requires that SDG&E train all maintenance personnel on the sensitive resources associated with the project and the necessity to avoid and minimize impacts to them. The measure requires all vegetation clearing to occur outside of the bird breeding season if the vegetation has not been cleared in the last two years. All other maintenance activities are to occur outside of the bird breeding season if feasible. If it is not feasible to schedule maintenance activities outside of the bird breeding season, then a qualified biologist working with an acoustician will determine if a maintenance activity would meet or exceed the 60 db(A) Leq hourly noise threshold where nesting territories of coastal California gnatcatchers are located. If noise levels are below this threshold, then the maintenance activity can proceed, if not, then a survey to locate gnatcatcher nests would be conducted. If an active nest is found, then all necessary impact avoidance and minimization methods will be employed, such as a biological monitor on site, continued noise monitoring, and noise reduction methods, or waiting until the young has fledged from the nest.

4.7.3 Effects to Critical Habitat

The Project would have potential permanent impacts to 11.33 acres of coastal California gnatcatcher Critical Habitat and potential temporary impacts to 16.51 acres of Critical Habitat (Table 2). These potential impacts would occur within the 14,508 acres of Critical Habitat in Unit 1, Upper San Diego and El Capitan Linkages (USFWS 2007). Measures to offset permanent impacts to designated Critical Habitat will include off-site acquisition and preservation of designated Critical Habitat at a 2:1 ratio. Measures to offset temporary impacts to designated Critical Habitat will include 1:1 on-site restoration (Measure 1.5.30). SDG&E will offset the loss of designated Critical Habitat through 16.51 acres of onsite restoration and offsite acquisition and preservation of 22.66 acres of designated Critical Habitat.

4.8 Least Bell's Vireo

4.8.1 Effects from Construction Activities

4.8.1.1 Direct Effects

Direct effects occur when biological resources are altered, disturbed, destroyed, or removed during the course of project implementation. During construction of the project, direct impacts to least Bell's vireo could occur due to loss of habitat.

Permanent effects such as habitat loss can occur due to the installation of permanent structures. This project will include installation of towers and poles, creation of new access roads, and creation of new work pads adjacent to the towers and poles. Installation of the new substation sites could also result in permanent loss of habitat. These impacts would result in the irreversible loss of biological resources. In the case of the least Bell's vireo, this would include the permanent loss of vegetation that supports the subspecies. Permanent direct effects could also include the "take" of the individual bird or loss of a nest.

To assess impacts to least Bell's vireo, all temporary and permanent impacts occurring in appropriate habitat such as riparian scrub and riparian woodland between Mileposts 59 to 119 were included in the calculations. Impacts to other vegetation types were eliminated. Approximately 6.82 acres of permanent habitat loss could occur due to installation of towers and pole, new access roads, and construction of the MRD Substation.

These permanent impacts can be minimized as described in Measure 1.5.1, which requires SDG&E to perform protocol surveys for least Bell's vireo. The pre-construction surveys for least Bell's vireo will identify occupied habitat so that it can be avoided where practicable.

Permanent direct effects can be further minimized during the design phase. Efforts can be made to place permanent structures in previously impacted areas or in areas containing lower quality habitat. SDG&E will implement Measure 1.5.15 to reduce or eliminate potential adverse effects to least Bell's vireo and its habitat as a result of construction activities.

SDG&E will ensure that_SDG&E's contractor, subcontractors, and project personnel receive environmental training prior to construction (Measure 1.5.2). This training will cover the appropriate work practices necessary to effectively implement SDG&E's measures.

Measure 1.5.3 will reduce impacts to least Bell's vireo habitat by restricting the construction of access roads and spur roads. This minimization measure restricts project vehicles to existing access roads and access roads constructed as part of the project,

except when not feasible due to physical or safety constraints. In addition, even though the project would be allowed to construct new access roads year round, this measure requires that every effort would be made to avoid constructing roads during the nesting season. If not feasible, SDG&E would perform a site survey, or more as appropriate, in the area where the work is to occur. This survey would be performed to determine presence or absence of threatened or endangered nesting birds, or other proposed or listed species in the work area. SDG&E would submit results of this survey to the USFWS and CDFG prior to vehicle use off existing access roads or the construction of new access roads.

If new access roads or spur roads must be built across streambeds and/or washes then the roads will be built at right angles to streambeds and washes if feasible (Measure 1.5.5). This will reduce impacts to potential least Bell's vireo habitat if riparian vegetation is located along these streambeds and washes. If it is not feasible to build the roads at a right angle then SDG&E would limit roads construction parallel to streambeds or washes to a maximum length of 500 feet at any one transmission line crossing location. Additionally, all construction and maintenance activities for these roads would be conducted such that disturbance to riparian vegetation would be minimized. If there is potential for least Bell's vireo at these locations, prior to construction, surveys to determine the presence/absence of least Bell's vireo would be conducted. If least Bell's vireo is present than all appropriate and reasonable measures to avoid or minimize potential impacts would be implemented.

SDG&E will also minimize impacts to least Bell's vireo habitat by requiring only the minimum amount of vegetation necessary for the construction of structures and facilities to be removed (Measure 1.5.16).

Measure 1.5.19 requires biological monitoring by a qualified biologist to ensure that all impacts occur within designated work limits, which will keep construction activities out of any adjacent least Bell's vireo habitat. The biologist will monitor any area subject to disturbance from construction activities and document project compliance.

SDG&E will minimize and compensate for impacts to sensitive vegetation communities, which include least Bell's vireo occupied or potentially occupied habitat (Measure 1.5.20). This measure requires that surface-disturbing components of the project (i.e. grubbing and grading) will be located in previously disturbed areas or where habitat quality is poor, to the extent possible, and disturbance of vegetation and soils will be minimized. This measure also requires that all limits of construction be delineated by orange construction fencing to eliminate and/or minimize inadvertent impacts to sensitive vegetation outside of the construction work limits.

If any of the jurisdictional areas potentially affected by the project has riparian vegetation that could potentially support least Bell's vireo, then Measure 1.5.27 could eliminate or minimize impacts to least Bell's vireo habitat. This minimization measure requires that impacts to jurisdictional area be avoided to the extent feasible. Where it is not feasible,

impacts to these areas will be mitigated as required as part of the project's wetland permitting.

SDG&E will conduct all brushing or grading construction activities within riparian habitats of the least Bell's vireo between September 16 and March 14, which is outside of the least Bell's vireo breeding season (Measure 1.5.27). This will eliminate direct impacts to least Bell's vireo during the breeding season for this construction activity.

To further minimize or eliminate additional potential impacts to least Bell's vireo, Measure 1.5.27 requires that for all other construction activities conducted during the least Bell's vireo breeding season of March 15 through September 15 within 500 feet of habitat in which least Bell's vireo are know to occur or have potential to occur, focused surveys for least Bell's vireo will be conducted by a qualified biologist one week prior to start of construction activity. If least Bell's vireo is present then a permitted biologist will survey for nesting vireo approximately once per week within 500 feet of the construction activity for the duration of the activity during the breeding season. If an active nest is located, then a 300-foot no-construction buffer will be established, if feasible, around the nest site until the nest site is no longer active. If construction must occur within 300 feet of an active least Bell's vireo nest, then a qualified biological monitor and a qualified acoustician will monitor vireo nesting activities and construction noise levels. If the biologist determines that construction is disturbing nesting activities and/or the construction noise levels meets or exceeds the 60 dB(A) Leg threshold, then construction will be stopped and the biologist will consult with the Wildlife Agencies on methods to reduce the noise and/or disturbance in the vicinity of the nesting vireo before construction can resume in this area.

SDG&E will offset impacts to occupied least Bell's vireo habitat or designated Critical Habitat through off-site acquisition and preservation of occupied habitat or designated Critical Habitat at a 3:1 ratio (Measure 1.5.27). SDG&E will provide offsite acquisition and preservation of 20.9 acres of least Bell's vireo occupied habitat to offset the Project's impacts.

Temporary effects are reversible, either naturally over time or with the implementation of measures such as onsite restoration. Potential temporary direct effects on least Bell's vireo for this project include the temporary removal of occupied habitat. Temporary workspaces such as staging yards, helicopter fly yards, workspace adjacent to the tower locations, and stringing sites will be required during construction to facilitate installation of the project.

Temporary effects from habitat loss can be minimized during both the design phase and the construction phase of the project. During the design phase, efforts can be made to place temporary workspaces in previously impacted areas or in areas containing low quality habitat. Based on current design, 13.55 acres of temporary loss of least Bell's vireo habitat is anticipated. SDG&E would offset any temporary loss of least Bell's vireo-occupied habitat through 1:1 on-site restoration and off-site acquisition and

preservation of occupied habitat or designated Critical Habitat at a ratio of 2:1 (Measure 1.5.27). Mitigation for the temporary impacts of the Project would result in the off-site acquisition and preservation of 27.1 acres of occuoied habitat and the on-site restoration of 13.55 acres of occupied habitat.

Temporary effects, other than habitat loss, associated with construction activities include short-term noise events. Direct disturbance in potential least Bell's vireo habitat would be considered a temporary impact because construction activities at isolated sites would occur over short periods of time (e.g., one to two weeks) and would primarily impact least Bell's vireo only if it occurred during the breeding season. Measure 1.5.27_will effectively reduce these impacts by eliminating some construction activities (grading and grubbing) in least Bell's vireo habitat during the breeding season and by requiring avoidance of other construction activities, if feasible, in occupied least Bell's vireo habitat during the breeding season. When not feasible to avoid construction activities in occupied habitat during the breeding season, additional components of this measure, such as monitoring and no-constriction buffer areas, would be in effect to minimize temporary impacts to this subspecies.

4.8.1.2 Indirect Effects

Potential indirect effects to least Bell's vireos from project construction include increased noise levels, increased vulnerability to predation, increase in human activities, and habitat degradation resulting from the establishment of non-native species.

Construction Activities

Construction activities that can cause potential short term indirect impacts to least Bell's vireos during the breeding season are activities such as surveying on foot, brush clearing for foot paths, and stringing of new wire and reconductoring, which may require dragging the conductor through habitat, and off road vehicle activities in potential habitat.

To eliminate or minimize indirect impacts by these types of construction activities, Measure 1.5.8 requires approval from the biological monitor before surveying and clearing brush on foot can occur in least Bell's vireos. For activities associated with stringing activities, this measure requires that SDG&E conduct surveys to determine presence or absence of nesting least Bell's vireos in the affected areas.

Indirect Noise Impacts from Construction

Construction noise may cause potential short-term indirect effects to nesting least Bell's vireo. Increased ambient noise levels during temporary short-term construction activities may mask the breeding songs used by least Bell's vireo. Additionally, intermittent loud noises from short-term construction activities may also cause nesting least Bell's vireo to become startled and abandon their nest. The measures discussed in Measure 1.5.27 will effectively reduce potential indirect effects to nesting birds

Predation

Transmission lines and support structures provide potential perching opportunities for raptor and corvid species, which can increase the potential for indirect impacts from predation of least Bell's vireo by raptors and corvids. To minimize potential impacts by corvids specifically, Measure 1.5.25 requires the preparation and implementation of a raven control plan. Indirect impacts from new perch sites on pole or tower support structures for brown-headed cowbirds, which are nest parasites, are also likely. In areas where current perching sites are few or rare, the construction of a new transmission line increases the potential for raptor, corvids, and cowbird perching and hence, predation and nest parasitism opportunities in the project area (APLIC 2006; Jalkotzy *et al*. 1997).

In portions of the project located in SDG&E's existing ROW, installation of new steel and wood pole support structures and the upgrading of existing structures will not significantly increase perching opportunities for raptors in the area.

Indirect impacts from increased nest parasitism as a result of new perch sites on pole or tower support structures are also unlikely to occur because many perch sites for cowbirds already occur on the existing utility towers and poles within the existing ROW and in trees within the small habitat patches currently supporting riparian-dependent wildlife within the vicinity of the existing ROW.

Construction activities that open up areas in native habitat, such as work areas and trails, and project personnel leaving food trash and debris in the work area can potentially attract predators to the work area leading to indirect impacts from predation. Predators such as common ravens, western scrub jays, and coyote can all be attracted to the work area by the above activities and they have the potential to prey on least Bell's vireo nests. To eliminate or minimize predator attraction, Measure 1.5.20 requires SDG&E to minimize disturbance to sensitive vegetation and Measure 1.5.6 prohibits littering of any food or waste in the project area and requires the removal of biodegradable or non-biodegradable debris from the ROW following completion of construction.

Human Disturbance

The presence of humans in potential least Bell's vireo habitat during the breading season can lead to potential indirect impacts. Indirect impacts from human disturbance can include temporarily changing least Bell's vireo breeding and nesting behavior, which can affect their ability to mate, build nests, and care for young on the nest. Many of the measures already mentioned in this section can eliminate or minimize disturbance to breeding or nesting least Bell's vireos by project personnel.

For human disturbance from non-project personnel, Measure 1.5.20 requires that entrances to access roads will be gated during and after construction to prevent the unauthorized use of these roads by the general public. Additionally, signs will be posted on the gates prohibiting unauthorized use of the access roads. Measure 1.5.3 requires the permanent closure of access road not needed for maintenance and that closed roads be

monitored and maintained to assure that unauthorized access by the public is not occurring.

Invasive Weeds

So that least Bell's vireo habitat is not degraded or reduced in quality as a result of project construction, any introduction of noxious weeds or exotic plants should be eliminated or minimized. SDG&E will develop and implement an Invasive Weed Control Plan (Measure 1.5.21).

4.8.2 Effects from Operations and Maintenance Activities

O&M activities of the transmission line will begin once installation has been completed. Standard O&M activities, such as road maintenance (grading), tree trimming, and structure replacement and repairs, could potentially impact least Bell's vireo. SDG&E will implement measures 1.5.1, 1.5.3, 1.5.4, 1.5.19, and 1.5.27 to ensure that potential adverse effects to the species are avoided and minimized. These measures will include, but not be limited to the following:

- Pre-activity surveys to determine presences/absence of least Bell's vireos
- Minimization of required workspace
- Conduct activities outside the breeding season
- Onsite biological monitoring
- Fencing or flagging of work space limits
- Onsite habitat restoration
- Acquisition of off-site mitigation

Measure 1.5.27 addresses potential impacts from maintenance activities to the least Bell's Vireo. This minimization measure requires that SDG&E train all maintenance personnel on the sensitive resources associated with the project and the necessity to avoid and minimize impacts to them. The measure requires all vegetation clearing to occur outside of the bird breeding season if the vegetation has not been cleared in the last two years. All other maintenance activities are to occur outside of the bird breeding season if feasible. If it is not feasible to schedule maintenance activities outside of the bird breeding season, then a qualified biologist working with an acoustician will determine if a maintenance activity would meet or exceed the 60 db(A) Leq hourly noise threshold where nesting territories of least Bell's vireos are located. If noise levels are below this threshold, then the maintenance activity can proceed, if not, then a survey to locate least Bell's vireo nests would be conducted. If an active nest is found, then all necessary impact avoidance and minimization methods will be employed, such as a biological monitor on site, continued noise monitoring, and noise reduction methods, or waiting until the young has fledged from the nest.

4.8.3 Effects to Critical Habitat

The Action Area does not fall within designated Critical Habitat for the least Bell's vireo. Therefore, no adverse effects to Critical Habitat will occur as a result of the Project.

4.9 Stephens' Kangaroo Rat

4.9.1 Effects from Construction Activities

Construction activities could potentially adversely affect undiscovered populations of the species by damaging or killing individual SKRs and by permanently removing habitat occupied by the species. This Project will include installation of towers and poles, creation of new access roads, and creation of new work pads adjacent to the towers and poles. These effects could potentially result in the permanent loss of habitat and individuals, although the potential for the species to occur in the Action Area is low.

4.9.1.1 Direct Effects

Based on the assumption that all potential SKR habitat that has not been surveyed is occupied by SKR, the Project would result in the permanent loss of 5.19 acres of habitat and the temporary disturbance of 23.62 acres of habitat. Mitigation acreages for these impacts will be calculated according to the ratios in Measure 1.5.36. This potential impact greatly overstates the impact likely to result from the Project. An accurate assessment of the amount of occupied habitat will be available once the surveys are complete. The pre-construction surveys for SKR will identify occupied habitat so that it can be avoided if practicable. If avoidance is not practicable, SDG&E would seek to salvage and relocate any individuals of the species discovered. All work areas within occupied SKR habitat will be fenced with an exclusion fence agreed upon by the USFWS and CDFG. All SKR within the fenced work areas will be trapped and relocated by a permitted biologist. Permanent effects can be further minimized during the design phase. For instance, efforts can be made to place permanent structures in previously impacted areas or in areas containing lower quality habitat.

4.9.1.2 Indirect Effects

Potential indirect effects to SKR from Project construction include increased dust levels, increased vulnerability to predation, and an increase in human activities.

<u>Construction Activities</u>
Construction activities, such as grading, tower footing excavation, and driving of heavy equipment on unpaved roadways could increase dust that may settle on surrounding vegetation. Such dust would be considered an indirect impact that would degrade the

overall quality of SKR habitat. Effects of dust on SKR habitat would be minimized through implementation of Measure 1.5.32.

Human Disturbance

Other potential indirect impacts include the increase of unauthorized traffic (ATVs, mountain bikes, hikers, horses) on maintenance roads, degrading potential SKR habitat.

For human disturbance from non-project personnel, Measure1.5.20 requires entrances to access roads be gated during and after construction to prevent the unauthorized use of these roads by the general public. Signs will be posted on the gates prohibiting unauthorized use of the access roads and roads not needed for maintenance will be permanently closed. Additionally, Measure 1.5.3 requires access roads to be monitored and maintained to assure that unauthorized access by the public is not occurring.

Predation

Transmission lines and support structures provide potential perching opportunities for owl species, which can increase the potential for indirect impacts from predation of SKR by owls.

Construction activities that open up areas in native habitat, such as work areas and trails, and Project personnel leaving food trash and debris in the work area can potentially attract predators to the work area leading to indirect impacts from predation. Predators such as foxes and coyote can be attracted to the work area by the above activities, and they have the potential to prey on SKR. To eliminate or minimize predator attraction, implementation of Measures 1.5.5 and 1.5.6 for the Project would minimize disturbance to sensitive vegetation, prohibit littering of any food or waste in the Project area, and ensure the removal of biodegradable or non-biodegradable debris from the ROW following completion of construction.

4.9.2 **Effects from Operations and Maintenance Activities**

As described in Measure 1.5.3, maintenance vehicles would be restricted to existing access roads, new project access roads, and maintenance pads to perform required maintenance operations (inspections, insulator washing, access road grading, etc.). All maintenance would be conducted during the daylight hours as to avoid the nocturnal activities of this species. Prior to road maintenance (re-grading), surveys will be conducted to locate any SKR or SKR burrows in the berms. All SKR will be trapped and relocated away from the road maintenance activity. No additional SKR habitat disturbance or loss is expected from routine maintenance activities.

4.9.3 Effects to Critical Habitat

There is no designated Critical Habitat within or immediately adjacent to the Action Area. Therefore, no adverse effects to Critical Habitat for SKR will occur as a result of the Project.

4.10 Desert Bighorn Sheep

4.10.1 Effects from Construction Activities

4.10.1.1 Direct Effects

The project runs south of permanently occupied habitat of the Carrizo Canyon ewe subpopulation and through an area that receives transient use by bighorn sheep. The permanent loss of bighorn sheep habitat as a result of the project will be approximately 30.65 acres. It is expected that 112.99 acres of habitat could be temporarily disturbed by the project (See Table 2). To offset the permanent and temporary loss of habitat, SDG&E would restore habitat and acquire and preserve 454.63 acres of Critical Habitat.

The proposed project is not expected to result in permanent direct impacts to individuals that would result in reduced survivorship or reproduction, nor is it expected to impair the recovery of desert bighorn sheep in the Peninsular Ranges. Transmission line construction has the potential to temporarily displace bighorn sheep from the transmission line corridor. However, this corridor is not high quality habitat, as evidenced by extensive boulder fields that cover it, a lack of permanent water sources, and little "escape terrain" within 0.3 kilometer of the transmission line corridor. Construction could result in some trampling of, or disturbance to vegetation in the immediate area of transmission towers and staging areas.

The likelihood of adverse effects occurring to bighorn sheep is further reduced by the fact that the proposed project crosses the Jacumba Mountains along an existing transmission line and interstate highway corridor. While this area is not permanently occupied, bighorn sheep have been observed in the area on a transient basis, and it is approximately 10 kilometer south of the permanently occupied habitat of the Carrizo Canyon ewe subpopulation. There are no permanent water sources in the I-8 island or between it and the U.S.-Mexico border.

Further, the potential risk from such activities can be reduced further by timing the construction activities to avoid overlap in areas surrounding critical resources (*e.g.*, lambing areas during peak lamb production, if lambing were known to occur in the area).

Bighorn sheep regularly respond to predators and other stimuli in their environment and they habituate to geographically predictable and non-threatening sources of human presence. A prime example has been in the northern Peninsular Ranges, where bighorn

sheep exhibit a high degree of habituation in the urban interface in the northern Santa Rosa Mountains. In the I-8 island area where construction of the Sunrise Powerlink would occur, there is abundant evidence of human activity. For example, Interstate 8 was constructed through the area in the 1960's. The SWPL was constructed through the area in the 1970s. For bighorn sheep to move south of I-8, they must cross under SWPL. For bighorn sheep to enter the I-8 island, they must cross under (or run across) I-8 with the din of constant auto and truck traffic that are climbing or descending the grade at high speed. Additionally, recreational hikers, off-road vehicle enthusiasts, and target shooters frequent dirt roads including the old highway 80, lower In-Ko-Pah Gorge, and Devil's Canyon. There is regular movement of illegal immigrants, drug smugglers, and their lookouts through washes, along ridges, and past water sources, as well as Border Patrol officers who seek to apprehend them. To illustrate the scale of human activity in the area south of Interstate 8, from January 2004 to March 2008, a total of 19,019 illegal immigrants were apprehended, turned back, or escaped capture in this area (data from R. Palmer, Supervisory Border Patrol Agent, El Centro District). Well-worn trails, and discarded water bottles and clothing, are found throughout the area, and immediately south of I-8 the sand washes are covered with human footprints.

In addition to the human activities described above, military helicopters traverse the area on training missions and Border Patrol helicopters conduct patrol and rescue operations in the area. On the north side of I-8 and west of the I-8 island, private residences and industry are found and In-Ko-Pah County Park, near a tourist attraction known as The Tower and Mountain Springs, both of which have permanent, developed water sources. Bighorn sheep also drink from open-topped Caltrans-maintained concrete cisterns (for auto radiators) that have been placed at half-mile intervals adjacent to the westbound lanes of I-8 (Border Patrol observations). Given the level of human activity, it is reasonable to conclude that bighorn sheep using the I-8 area have acquired some level of habituation.

Previous studies on transmission line construction suggest that permanent impacts to bighorn sheep are negligible as long as appropriate minimization and mitigation measures are implemented. During construction of the Palo Verde-Devers No. 1 transmission line through the Kofa National Wildlife Refuge (NWR) and Copper Bottom Pass in the Dome Rock Mountains of Arizona radio collared bighorn sheep were monitored for movement and behavior. The results did not reveal a significant impact to bighorn sheep from transmission line construction activities in areas adjacent to bighorn sheep habitat (Smith *et al*. 1986).

In the rugged I-8 island area, helicopters will be used for tower construction. Helicopters used in the construction of transmission towers and line-stringing follow predictable flight paths from fly yards to tower sites. This has the advantage of reducing the length of the construction period, and the impacts on bighorn sheep habitat because access roads are not needed, and tower pads do not have to be cleared.

Various buffer zones for helicopters have been suggested for bighorn sheep. Stockwell et

al. (1991) reported that bighorn sheep in the Grand Canyon reacted to frequent (as many as 15 per hour) sightseeing helicopter flights by reducing foraging efficiency while on their fall-winter range in the higher elevation slopes of the canyon, and when the sightseeing helicopters approached closer than 250-450 meters. No significant effect was found when bighorn sheep were lower in the canyon during spring and summer, and therefore farther away (250-700m distant) from sightseeing helicopters. The authors recommended a 500m buffer zone under these circumstances (of daily helicopter overflights over many years) to minimize potential effects to bighorn sheep foraging. The primary cause of reduced foraging efficiency in this study was from the bighorn sheep looking up frequently and not foraging, rather than from fleeing approaching sightseeing helicopters. No effect on individual fitness or population demography was reported.

Helicopter surveys have been conducted every other year in the Peninsular Ranges by the CDFG. These surveys have been flown in contours approximately 50 meters above the ground, allowing observers to easily identify and correctly classify bighorn sheep. As part of this and other research in the Peninsular Ranges, the CDFG also regularly captures bighorn sheep for radio-collaring and other research by helicopter pursuit and net-gunning. While bighorn sheep are generally unharmed by this activity, those that have been previously captured by helicopter can react to closely approaching helicopters by fleeing or temporarily moving several kilometers out of the area (Bleich *et al*. 1990, 1994). The bighorn sheep intermittently observed in or near the I-8 island area where construction will occur, have not been collared (USFWS 2008) and therefore have not yet been adversely conditioned to helicopters.

Measures to minimize the potential to adversely affect bighorn sheep include preconstruction surveys for bighorn sheep (conducted prior to construction and maintenance), and if bighorn sheep are found, then SDG&E will consult with USFWS and CDFG to determine whether additional measures are needed to effectively minimize potential impacts to bighorn sheep. Additionally, potential impacts from helicopters will be minimized by: (1) following regular flight corridors that avoid occupied bighorn sheep habitat to the maximum extent possible during authorized construction periods; (2) avoiding areas within 0.6 miles (1 kilometer) of lambing areas from January 31 to May 1, when 87 percent of lambing occurs in the Peninsular Ranges (Rubin *et al*. 2000); (3) avoiding lamb-rearing areas to the extent possible for an additional month, until June 1; (4) avoiding low-flying within 0.6 miles (1 kilometer) of critical bighorn sheep water sources during the hottest time of the year from June 1 to September 1; and (5) avoiding the use of low-flying "shortcuts" over bighorn sheep habitat during authorized construction periods.

4.10.1.2 Indirect Effects

Bighorn sheep regularly respond to predators and other stimuli in their environment, and experience has shown that they habituate to geographically predictable and non-threatening sources of human presence. Experience with transmission lines constructed

through, or adjacent to, desert bighorn sheep habitat has shown that they are not barriers to movements for either sex. Where bighorn sheep had the opportunity to cross under transmission lines, they did so. In all cases, population number has been unaffected by the presence of transmission lines.

Construction Noise/Human Disturbance

The reaction of bighorn sheep to various types of human activity is a subject that has been extensively reported upon (Blong and Pollard 1968; Boyce *et al*. 1992; Campbell and Remington 1981; Cunningham 1982; Cunningham and Ohmart 1986; Deforge 1972; Deforge *et al*. 1982, 1995, 1997; Etchberger 1989; Etchberger and Krausman 1999; Graham 1980; Hamilton *et al*. 1982; Harris 1992; Hicks and Elder 1979; Holl and Bleich 1983; Jorgensen 1974; Keller and Bender 2007; King and Workman 1986; Leslie and Douglas 1980; MacArthur *et al*. 1979, 1982; McCarthy and Bailey 1994; Oehler *et al*. 2005; Papouchis *et al*. 2001; Purdy and Shaw 1981; Rubin *et al*. 1998, 2000, 2002; Wagner 1999; Wehausen 1983; Wilson *et al*. 1980). While bighorn sheep often react to humans by walking or running to increase the distance between them, none of the studies above demonstrated the effect of human disturbance on individual bighorn sheep survival, or on population demography. Similarly, none documented any permanent abandonment of range due to temporary human disturbance. The handful of papers that measured flight response to humans reported a limited and transitory behavioral response to human activity over short distances and that response occurred because the bighorn sheep were directly approached (Hamilton *et al*. 1982; Hicks and Elder 1979; Keller and Bender 2007; King and Workman 1986; Papouchis *et al*. 2001). The one paper that utilized an experimental design to measure demographic effects of human activity on bighorn sheep reported that the bighorn sheep population actually increased along with the number of hikers in a particular area (Wehausen 1980). While it is possible that some human activities in bighorn sheep habitat could have a deleterious impact on bighorn sheep in some circumstances (e.g. if excluded from critical resources), evidence of a general deleterious effect is lacking.

4.10.2 Effects from Operations and Maintenance Activities

Available information suggests that transmission lines do not permanently degrade or fragment bighorn sheep habitat, and do not pose a significant threat to this species. There is no empirical evidence that bighorn sheep avoid or abandon habitat near transmission lines, or that they avoid moving under transmission lines. Once constructed, transmission lines and support structures are inanimate objects in the environment. The following are examples of transmission lines constructed and operated in the vicinity of bighorn sheep habitat:

> Palo Verde-Devers No. 1 is a 500 kV lattice tower transmission line which was constructed across the Kofa NWR in 1982. Prior to construction of Palo Verde-Devers No. 1, E. Linwood Smith and the Arizona Game and Fish Department conducted a six-year study of bighorn sheep and their movements in this area,

which resulted in two reports and several papers on bighorn sheep movements, mortality, and potential for human disturbance (Cochran *et al*. 1984; Smith et al. 1986). The two reports were produced specifically on Palo Verde-Devers No. 1 and the transmission line's potential impacts on bighorn sheep, and the studies represented one of the first intensive radio tracking and behavioral studies of bighorn sheep, as well as the first to document long distance movements between mountain ranges by this species (Witham 1979; Cochran and Smith 1983).

Once construction began, and continuing after construction ended, Smith et al. (1986) measured differences in crossing rates and home ranges for the bighorn sheep in the Dome Rock Mountains from those of the New Water Mountains/Livingstone Hills/Kofa Mountains. From the data on ram crossings in the Dome Rock Mountains, Smith et al. reported a result that was largely contrary to expectations:

> Construction period crossing rates of 52.3/month were compared with expected rates of 20.0/month and post-construction crossings occurred at the rate of 30.0/month…. the inference from the preceding analysis is that sheep were attracted to the activity as opposed to being repelled by it. Regardless of explanations we may apply to these observations, it is abundantly clear that construction and operation of the transmission line did not preclude bighorn from moving freely back and forth across the transmission line corridor in the Dome Rock Mountains.

Some bighorn sheep remained in close proximity to the transmission line corridor, even during construction. One ewe in particular (number 5C) was found to be a permanent resident of the Copper Bottom Pass area prior to, during, and following construction. This ewe lived within 1.79 kilometer of the corridor centerline and crossed it nine times prior to construction, 22 times during construction, and 28 times after construction. According to Smith et al. (1986), "None of our data suggests that construction and operation of the Palo Verde to Devers 500 kV transmission line had any effect on the activities of this sheep."

As discussed previously, in the Dome Rock Mountains, transmission line construction and operation had no apparent negative effect on crossing rates or home ranges. In sum, the focused research on bighorn sheep prior to, during construction, and during operation of the 500 kV Palo Verde-Devers No. 1 transmission line showed only a minor, transient effect on bighorn sheep. The overall conclusion by researchers Smith et al. (1986) was: "To summarize the preceding material, it appears generally that construction and operation of the Palo Verde to Devers 500 kV Line 1 had little negative impact on bighorn populations in the Dome Rock Mountains, New Water Mountains, or the Livingstone Hills. There were no clear indications that construction or operation of the line caused nearby resident sheep to abandon or even move normal home

areas. Quite to the contrary, several individual sheep most directly affected actually appeared to be drawn to construction activity."

Since the construction of Palo Verde-Devers No. 1, there has been no negative demographic effect of transmission line construction and operation on the bighorn sheep population in Kofa NWR. This population has been consistently over 800 individuals for nearly two decades post-construction. They were so productive that from 1957 through 2006, 569 bighorn sheep were captured and removed from the refuge for translocations to establish or augment populations elsewhere. Additionally, the Arizona Game and Fish Department has regularly issued five to seventeen hunting permits per year since 1960 (Kofa NWR and Arizona Game and Fish Department 2007). Research conducted by the Arizona Game and Fish Department and Kofa NWR in response to a bighorn sheep population decline that occurred between 2000 and 2006 concluded that the recent decline was due to the combined effects of drought and mountain lion predation (Kofa NWR and Arizona Game and Fish Department 2007).

In the Eldorado Mountains, east of Hoover Dam, eight high capacity transmission lines traverse bighorn sheep habitat southeast of the dam. The transmission lines were constructed decades ago. Bighorn sheep in these mountains regularly cross back and forth under transmission lines and forage under transmission lines in this area (observations from K. Longshore, University of Nevada Las Vegas; P. Cummings, Nevada Department of Wildlife).

In the Central Mojave bighorn sheep metapopulation, Bleich et al. (1997) documented repeated movements of bighorn sheep among the Old Dad Mountain, Cowhole Mountain, Kelso Peak, and Marl Mountains. The 500 kV Eldorado-Lugo transmission line runs between Old Dad Mountain, Cowhole Mountain, and East Hills on one side, and the Kelso Peak and Marl Mountains on the other. Two 230 kV transmission lines and dirt access roads run parallel to the 500 kV Eldorado-Lugo transmission line through the same area. The transmission lines were constructed decades ago. No deleterious effect of these transmission lines has been reported on bighorn sheep behavior or movements. The Old Dad Mountain population is currently estimated at 201-300 (Epps *et al*. 2003), and this population has been the source for numerous bighorn sheep translocations (>150), as well as trophy ram hunting since the early 1980s. Bighorn sheep regularly move between ranges on opposite sides of the transmission line corridor (Bleich *et al*. 1997; J. Wehausen, unpublished data).

In the Central North Mojave bighorn sheep metapopulation, four transmission lines, a buried gas pipeline, and two dirt roads run between the Clark Mountains and the Mesquite and Kingston Mountains to the north. These transmission lines include the McCullough-Victorville 1 & 2, which are 500 kV each, the 500 kV Intermountain DC, and the 230 kV Hoover-Victorville. The transmission lines were constructed decades ago. No deleterious effect of these transmission lines

has been reported on bighorn sheep behavior or movements. Jeager (1994) documented regular movements of both sexes of bighorn sheep passing back and forth between the Clark Mountains and the Mesquite Mountains, and between the Clark Mountains and the Spring Mountains. This included seasonal migration of eight radio-collared ewes. Bighorn sheep had to cross under the four transmission lines to make these migrations. The Clark Mountain population is estimated at 25-50, and the Kingston-Mesquite population is estimated at 51-100 (Epps *et al*. 2003).

In the Central Mojave metapopulation, Bleich et al. (1990) documented movement of bighorn sheep between the Old Woman and Turtle Mountains. These two bighorn sheep populations have a 230kV transmission line and dirt roads running between them. No deleterious effect of this transmission line has been reported on bighorn sheep behavior or movements. Both bighorn sheep populations are estimated between 51-100 individuals (Epps *et al*. 2003).

In the "island" area of Interstate 8, east of Mountain Springs, bighorn sheep have been observed intermittently for years (Cunningham 1982; R. Botta, CDFG, unpublished data; USFWS 2008). Occasional bighorn sheep have been observed south of the transmission line. Such movements require that bighorn sheep cross under the 500kV Southwest Powerlink transmission line. There has apparently been an increase in bighorn sheep use of this area in recent years, despite the existence of the Southwest Powerlink (USFWS 2008), Interstate 8, and increasing number of illegal immigrants passing through the area on foot.

Based on the studies above and the AMMs proposed, indirect effects on bighorn sheep resulting from operation or maintenance of the Project are expected to be minor. Because transmission line construction and operation do not have demonstrated deleterious effects on bighorn sheep movements, the Project is not expected to adversely affect efforts to reconnect the U.S. bighorn sheep populations with populations in Mexico.

4.10.3 Effects to Critical Habitat

The project would have potential permanent impacts to 30.65 acres of desert bighorn sheep Critical Habitat and potential temporary impacts to 112.99 acres of Critical Habitat (Table 2). These potential impacts would occur within the 79,220 acres of critical habitat associated with Carrizo Canyon in southern San Diego and Imperial counties (USFWS 2008). To offset these impacts, SDG&E would enhance habitat by funding construction of a highway overpass and long-term control of invasive species, and would provide for acquisition and preservation of 454.63 acres of Critical Habitat as well as restoration of temporarily disturbed Critical Habitat (Measure 1.5.24).

5.0 GROWTH-INDUCING EFFECTS

The purpose of the Project is to increase the reliability of electricity supply and to allow for system expandability for areas that already receive electricity supply. Construction of the Project will not cause growth or development to occur and there are therefore no growth-inducing effects associated with the Project.

6.0 CUMULATIVE EFFECTS

Cumulative effects include those effects of future state, tribal, local, or private actions that are reasonably certain to occur in the Action Area considered in this Biological Assessment. Future federal actions that are unrelated to the proposed action do not meet the definition of cumulative effects and are therefore not considered in this Biological Assessment. The Action Area consists of a right-of-way that crosses federal lands for 100 out of the total 120 miles. Future activities on the federal portions of the Project route will require federal authorization, which would cause the activities to not meet the ESA definition of cumulative effects. No reasonably certain future state, tribal, local, or private actions have been identified in the non-federal portions of the Project route. As a result, no cumulative effects have been identified in the Action Area.

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